

The CIO WRAPSHEET

YOUR GUIDE ON MARKETING TO INFORMATION EXECUTIVES

WINTER 1997

www.cio.com/marketing

VOLUME 4, No. 1



Sound Bites

Lockheed Martin's relationship with CIO Communications is an essential ingredient in the success of our marketing plan, which focuses on reaching the top decision makers, namely IT executives. They're the ones who set the overall direction and long-range, strategic plans ...

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Walt Wilson
Vice-President, Marketing
Lockheed Martin

CIOs' STAYING POWER

Be sure to take your marketing message to the top of the IT organization because these executives are in there for the long haul, according to important new research from *CIO* and *Human Resource Executive* magazines.

The results from this survey of human-resource executives at 500 large U.S. companies dash the misconception that the top IT post is a short-lived career stop.

With the application of technology key to the bottom-line, CIOs are occupying the executive suite for a median stay of five years. In terms of longevity, they're quickly catching up to their counterparts in finance, sales and marketing and manufacturing/operations - and outpacing their colleagues in human resources.

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CIO Turnover Myth

"There's a myth of CIO turnover being exceptionally high, and that myth has been unhealthy for IT execs," says Abbie Lundberg, editor of *CIO*.

**40% of IT
vice presidents and
35% of IT managers
and directors have been
in their positions for
more than five years.**

"These results prove that a CIO's job tenure is not unlike that of other executives."

That's especially true when comparing the IT chief's longevity with other executives in the same company. In 71% of the companies surveyed, the previous IT chief was on the job as long if not longer than at least one of his or her functional peers. So much for myths.

Honing their Expertise

At many companies, the title 'CIO' is a recent addition to the executive roster. But the survey results imply that technology executives are promoted into the CIO role after honing their technology and business expertise as managers and directors.

CONTINUED ON PAGE 3



CIO Communications, Inc.

Tips For Reaching CIOs

With CIOs now well established in the executive inner circle, it's more critical than ever that your company's marketing message reaches them.

How do you build relationships with an audience that has plenty of buying clout but little time to hear your message? It's important to understand their job challenges (see chart below) and then craft both a short- and long-term marketing approach that helps CIOs meet those challenges.

You might only get five minutes with the IT chief, but you can take steps to make every minute count.

Marketing guru Jim Sterne, president of Target Marketing of Santa Barbara, recommends the following tips for success:

1. CREATE DIFFERENT LEVELS OF MESSAGES.

Sound simple? It's not. The explosive growth in the size of IT departments has opened up diverse staffing specialties, with the CIO at the top. High-tech marketers need to master the protocols of communicating with all of them. For example, while the head of network services will eagerly peruse the data sheets on your product, a CIO will pass them over, says Sterne. Speak to CIOs in the language of the boardroom, says Sterne: "CIOs want to hear the business benefits of a new technology explained in as few words as possible."

2. BE A CREDIBLE SOURCE OF INFORMATION.

Get to know the CIO's vision and goals for the organization and become an outside resource. "The best way to

CHALLENGES

1. Keeping up with the latest in technology
2. Scheduling time for strategy planning
3. Managing user requirements
4. Identifying business needs and setting priorities
5. Funding/justifying spending
6. Managing and motivating personnel
7. Managing expectations of users/top management
8. Lack of time and resources
9. Politics
10. Communicating/implementing new technologies to staff & associates

CIO Magazine Editorial Survey

win the heart and mind of someone in power is to include in every phone call, email or fax information that's immediately useful to them in furthering their goals or their career," says Sterne.

"Fire off a message and say 'I thought you might find this interesting.' Then follow with a lunch invitation. Put yourself in the position of being a helper."

3. PAY ATTENTION TO THE CIO AS AN INDIVIDUAL.

"There are a finite number of CIOs, so it pays to treat them as individuals," advises Sterne. "Know your audience: they're bright, they have too much on their plate, they're aware of the trends, and they want solutions." ❧

Q & A WITH LISA BROWN

According to the most recent CIO Magazine Editorial Survey, the number one priority that CIOs face is keeping up with the latest technology.

We recently asked Richard Amari, VP of Information Systems at Victoria's Secret, to give us a sense of how CIOs stay on top of all of the new technologies.

Brown How does your organization evaluate hot new technologies for your organization?

Amari The IT organization has formed a technology team which I oversee. The group researches and evaluates emerging technologies to understand their potential and how they can be applied to achieve critical business initiatives for the next 12 months. The team then makes recommendations to executive management.

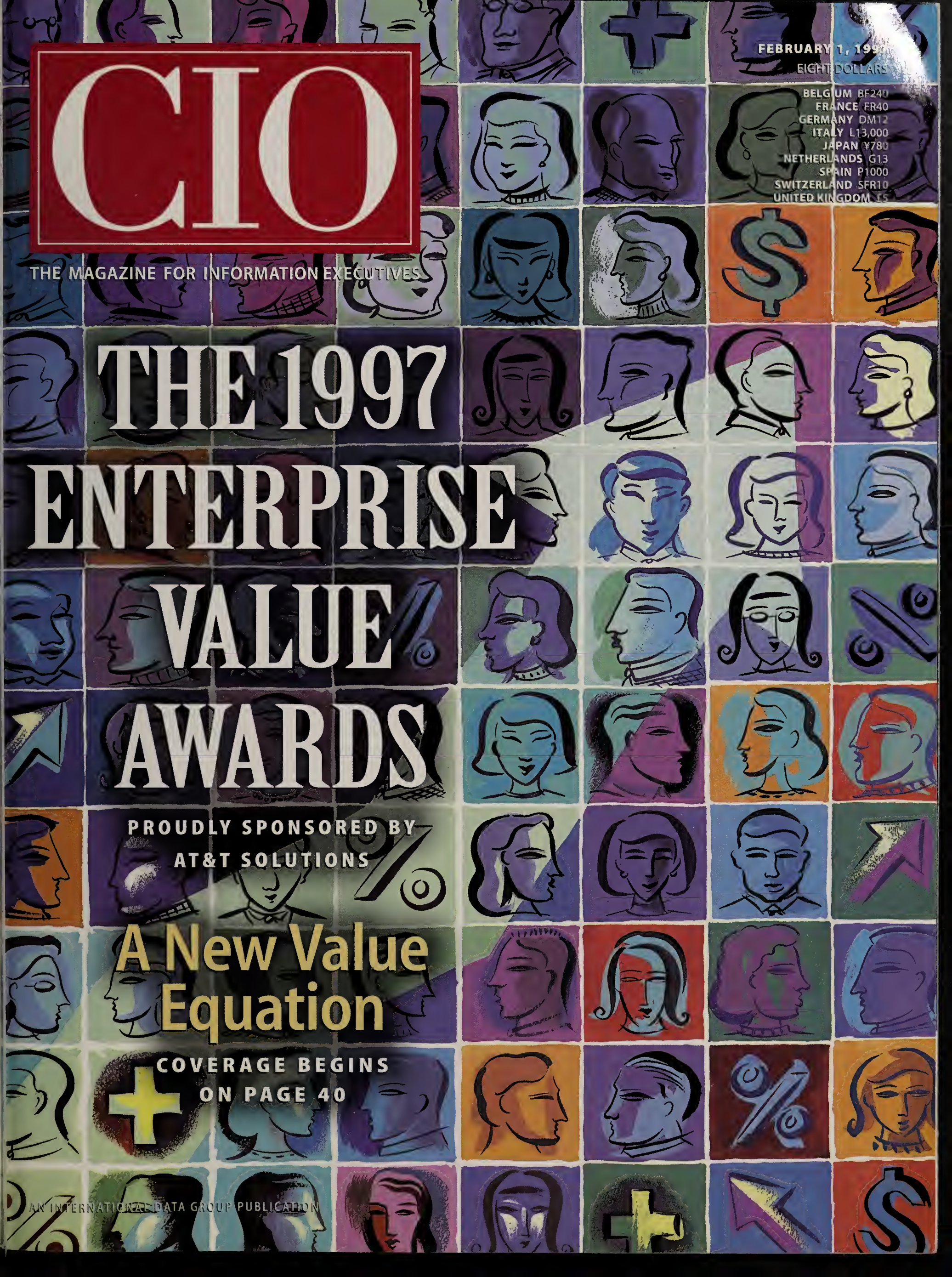
Brown What resources do you use to gather information?

Amari One of the most credible sources are magazines. I'll actually pick up the phone and call the person who wrote the article or the person who was quoted in the article. I do a lot of clipping and routing; if there is an article of interest, I want executive management to be on the same wavelength so they can understand the business value and implications of a hot new product.

We regularly use the Internet and Web to find as much information as possible on a company or product. And participating in online discussion forums gives us a sense of what challenges our peers are facing. The team also attends seminars, as well as vendor and industry conferences.

Brown In what ways are conferences particularly helpful?

Amari I regularly attend executive management conferences like *CIO Perspectives*; it's a great networking opportunity and learning experience. Small, focused conferences give us the opportunity to form close relationships with our vendors and partners, which in turn helps us keep up with emerging technologies. ❧



CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

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THE 1997 ENTERPRISE VALUE AWARDS

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A New Value Equation

COVERAGE BEGINS
ON PAGE 40

AN INTERNATIONAL DATA GROUP PUBLICATION

An aerial, black and white photograph of a dense forest. A light-colored dirt road or path winds through the trees, starting from the bottom left and curving towards the top right. The trees are small and densely packed, creating a textured, stippled appearance. The overall tone is somber and naturalistic.

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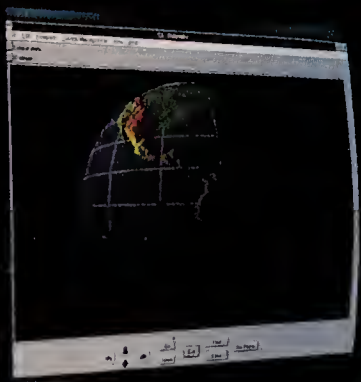
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Inside CIO

VOLUME 10 • NUMBER 8 • FEBRUARY 1, 1997

SPECIAL ISSUE



Cover illustration
by Linda Bleck

THE ENTERPRISE VALUE AWARDS

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This year's EVA recipients possess the key elements to develop successful systems.

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By Jennifer Bresnahan

BELL ATLANTIC

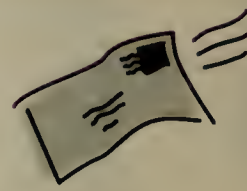
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This telecommunications provider improves communication and profits by cutting the static between salespeople and customers. *By Tom Field*

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CIO PORTFOLIO 98

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Executive Compensation, Managing IT Standards

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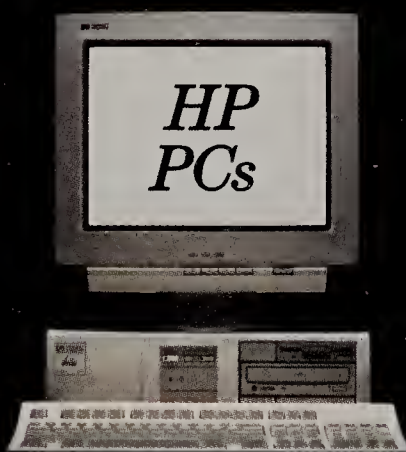
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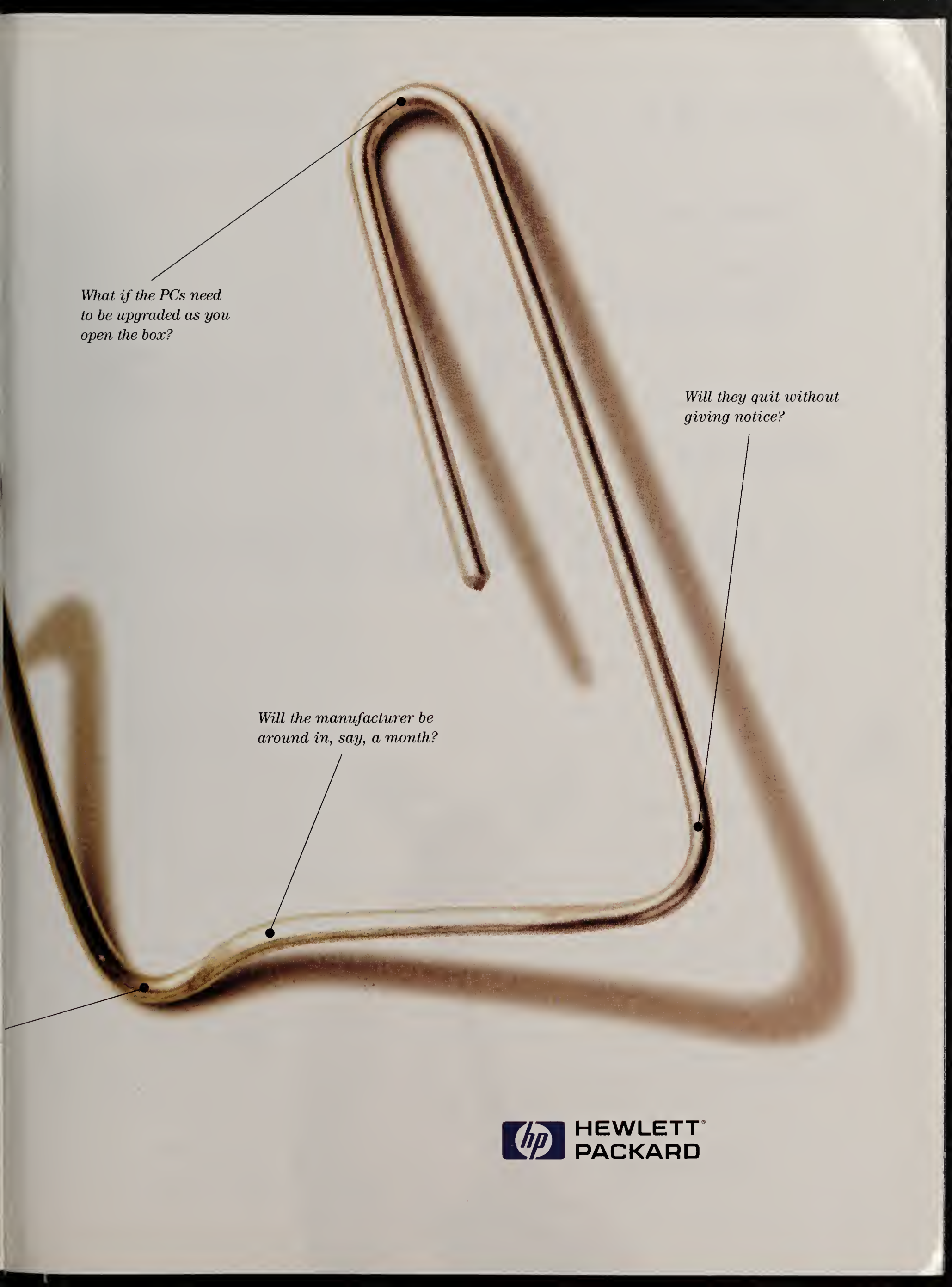


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giving notice?*

*Will the manufacturer be
around in, say, a month?*

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Inside CIO



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In 1991, building a worldwide corporate network based on TCP/IP struck Schlumberger as a wise move. Today, the network helps the company's clients strike oil. *By E.B. Baatz*

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IS helped the nation's largest bank develop more profitable relationships with its small and midsize business customers. *By Tom Field*

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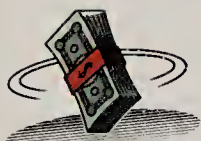
Studying the world's software development trends can help CIOs make the grade. *By Howard A. Rubin*



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As a result of going electronic, the state of Texas and the federal government have saved millions of dollars and taken a big bite out of fraud. *By Paula Jacobs*

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New On Our Web Site

cio.com

<http://www.cio.com>

VALUABLE INFORMATION

Looking for more details about our **Enterprise Value Awards**? We offer links to past winners' Web sites, reports from the Enterprise Value Retreat taking place Feb. 2-5 and the particulars on how to apply for next year's awards.

www.cio.com/forums/EVA.html

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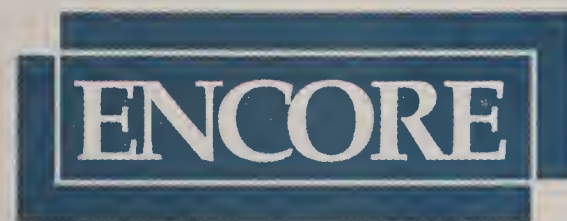
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LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

Being involved in the Enterprise Value Awards process has been a fascinating experience. Discussions with the business and IS applicants, the process team members and the judges advanced my own thinking on how people can create value through the use of IT. With so many different perspectives represented, one thing became clear: There are as many ideas about what value is, what technology does (or doesn't) have to do with creating it, and how to quantify and articulate it as there are lines of code in an enterprise.



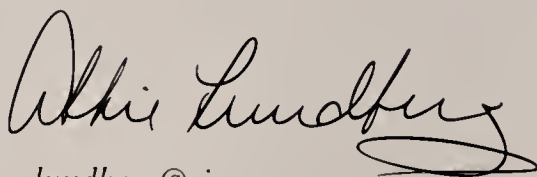
One interesting disconnect occurred over the issue of proving value to top management. The editors and process team agreed that IS executives were wrestling with methods not just for determining the potential value of systems projects but for convincing their peers and bosses. However, when we asked our panel of judges how they sell systems to top management, they seemed almost puzzled by the question. "That's really not an issue," said one judge. "I have a very enlightened CEO; we work together to determine value for the business."

For most of *CIO*'s readers, I'm afraid, such a partnership is a distant dream for many reasons. Business executives should include the CIO in business planning and keep an open mind to ideas

coming from IS, but the CIO has to understand there are no free rides, and there are few second chances. The first opportunity you get to prove yourself, you'd better make it pay.

The success of this year's awards process is due in large part to Rick Swanborg, managing director of Tradewinds Associates, who led our process team. Rick brought together an outstanding group of people to gather and verify the data on the applicants (see Page 42). He also encouraged us to begin exploring whether the applicants have established their own internal processes to test the value of their systems—a question that we hope will have its own value for the applicants.

I have one sad note to add. This is the last issue to which Senior Editor E.B. Baatz will contribute as a member of our staff, though she will continue to write our Metric Systems column. We wish Elizabeth the best of luck both professionally and personally.


lundberg@cio.com

FROM OUR READERS

ROLE PLAY

The key difference between the CIO role and other executive roles such as CFO and human resources vice president [Special Report: The CIO Career, Nov. 1, 1996] is that the latter two can steer clear of trouble by maintaining the accounting books and cash position or by keeping the personnel policies/procedures and training programs current, respectively.

If the business is not generating enough cash, the CFO does not take the blame. If employee morale is down, the HR VP does not get saddled with responsibility. Both are considered scorekeepers and staff enablers for the CEO's direct reports. By contrast, the CIO has often taken on the accountability for delivering business benefits with their technology. Usually the troubles that arise are caused by lack of line-management ownership of their successful business implementation.

CIOs need to master the process of project management to deliver their initiatives on time and on budget and to appropriate-

"Silicon Graphics chose and implemented Oracle Applications in just 15 months."

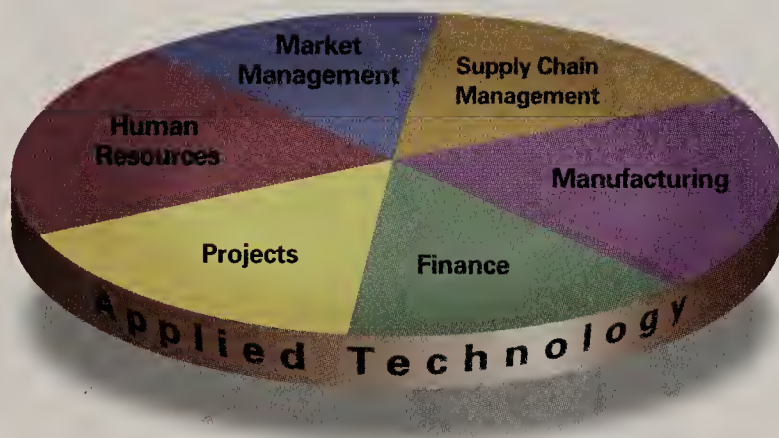
**Ed McCracken, Chairman and Chief Executive Officer
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Keith C. Cowan

President

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STRANGE FRUIT

Our office staff enjoyed the article regarding the Fruit of the Loom online distribution channel ["The Fruits of Their Labors," Nov. 15]. We were puzzled, however, as to what type of fruit Paul Cimino was supposed to represent in the cover photograph. We would very much appreciate an answer to this mystery.

Haven Abedin

Research Assistant

F1 Services Inc.

Dallas

flsrvc@ix.netcom.com

We're glad you asked! Many of us were wondering the same thing. The company reports that the mystery "fruit" is actually a bunch of leaves.

UTILITARIAN THOUGHTS

I'm going to take you up on your invitation to let you know what the term "utility" means to me [In Box, Nov. 15].

Utility with respect to technology is

the future in its best sense. I am amazed at the things made possible by technology, based on my experience. When I think ahead, however, I am more than a bit embarrassed about the state of technology today—it is not nearly ready for prime time. It's like pretending that the average American is really ready for WebTV before the infrastructure can handle it (just ask Sony).

Today's CIO must understand and manage chaos. The pace of change in this industry does not translate to utility. Economic factors that drive this industry do not contribute to utility. Yet utility is the light at the end of

the tunnel. It is utility that will be the final bandwagon, riding into the sunset as everyone jumps on without noticing that they have jumped. Sometimes I fear I'll miss that sunset.

Peter Greco

Director, Information

Systems

Lewis & Clark College

Portland, Ore.

greco@lclark.edu

There is another parallel to the term "utility" that applies to the IS group as well as many utility services. Most utilities (especially electric) are entering an era of deregulation. That environment is forcing them to become diversified, efficient, cost-conscious and proactive in providing a superior product in a customer-centric manner. Similarly, IS groups are required to carry out the objectives of businesses that struggle to differentiate themselves in a fiercely competitive market.

That requires them to evaluate and implement new technologies, master new development tools and provide 24/7 support for increasingly complex architectures that must have minimal downtime. The efforts of those IS groups seem more superhuman than utilitarian.

Steve Long

MIS Planning Specialist

Lakeland, Fla.

slong@city.lakeland.net



How to Reach Us

Phone: 508 872-0080

Fax: 508 879-7784

Address: CIO Communications Inc.,
492 Old Connecticut Path, P.O. Box 9208,
Framingham, MA 01701-9208

Web Site: www.cio.com

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Managing Editor Richard Pastore

Senior Editor E.B. Baatz

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Copy Editors Jay F. Rizoli, Sara Shay

Senior Writers Carol Hildebrand,

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Administrative Assistant Lisa Jayne Kerber

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Contributing Writers

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Marketing Comm. Manager Marcy L. Dill

Trade Show Coordinator Dot Caspersen

Research Specialist Caroline Cerullo

Marketing Comm. Specialist Karen Fogerty

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VP/ Finance & Admin. Walter Manninen

Assistant to the Publisher Diane Martin

Office Services Assistant Vivian Kissileff

Billing Coordinator Lynn J. Palmquist

Financial Analyst Chad Marston

Accounting Specialist Kerry Grady

INFORMATION SYSTEMS

Chief Information Officer Bruce M. Friedman

Manager, Network Services Didier Weizman

Manager, Desktop Services James C. Burgoyne





Conference Supplement to CIO Magazine

March 23-26, 1997
Sheraton San Diego Hotel & Marina
San Diego, California

Leading the Charge in Turbulent Environments: *IT as a Change Agent*

Keynote *Strategic*
Presenters *insuring*
financial
profitability
Featuring *for the future*

Peter Drucker
Warren Bennis
Tom Davenport
Jack Trout

Plus

The People Side of
Change Roundtable
Riding the
Hypercompetition
Wave
Map Your Own
Change Route



CIO

PERSPECTIVES

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Lynda Rosenthal and Joseph L. Levy

Constantly Making Change...Happen

CIOs must understand the nature of both leadership and change.

Agenda

Detailed information about each general and concurrent session and scheduled activities throughout the conference.

Corporate Hosts

During the conference our Corporate Hosts, a select group of innovative, visionary companies, will display a wide range of solutions to address strategic and operational IT challenges.

Companion Program

Participation in the Companion Program includes all scheduled meals, receptions, entertainment, a special companion breakfast, a stretch and tone class and a San Diego By Land and Sea Tour. The Companion Program does not include conference session attendance.

Enrollment Form

Complete the online enrollment form at <http://www.cio.com> or complete the form on the back of this brochure and fax it to 508 879-7720. You can also call us toll-free at 800 366-0246.

Conference Overview

When Descartes said "the more things change, the more they stay the same," he certainly had never tried life as a CIO.

Our latest CIO Perspectives conference, **Leading the Charge in Turbulent Environments: IT as a Change Agent**, March 23-26 at the Sheraton San Diego Hotel & Marina in San Diego, Calif., will allow IT executives to investigate the differences between leading and managing strategic corporate change.

Our keynote presentation will team two of the world's most noted authorities on corporate change and management, **Peter F. Drucker** and **Warren Bennis**. Our moderator once again will be **Jim Wetherbe**, director, MIS Research Center, *University of Minnesota*, Federal Express Professor of Excellence and director, Center for Cycle Time Research, *University of Memphis*.

Sessions will feature how organizations have survived change and progress. Featured presenters include **John Dahms**, CIO, *Central Intelligence Agency*; **Dr. William Limond**, group director, information services, *British Gas PLC*; and **James J. Skinner Jr.**, vice president of systems, *Swiss Reinsurance America Corporation*. **Abbie Lundberg**, editor, CIO Magazine, will moderate a roundtable discussion on specific techniques IS executives have implemented in driving change, featuring **David Kepler**, director of information systems, *The Dow Company*; **Phil Newbold**, former vice president and director of information technology services, *Kaiser Permanente*; **Debra Robinson**, vice president, information systems and technology, *Delaware North Companies, Inc.*; and **Linda Wiersema**, general manager of information technology and CIO, *LTV Steel*.

Jack Trout, president, *Trout & Partners*, will discuss the world's best business strategies. This conference will also feature **Tom Davenport**, Curtis Mathes Fellowship Professor and director, information systems management program, College and Graduate School of Business, *University of Texas at Austin*, **Richard D'Aveni**, professor, Amos Tuck School of Business Administration, *Dartmouth College* and **Eileen Shapiro**, president, *The Hillcrest Group, Inc.*

To enroll, please visit our Web site at <http://www.cio.com> or complete the enrollment form on the back of this brochure and fax it to 508-879-7720. You can also call us at 800 366-0246. **Don't delay! Sign up now for the most relevant conference of the year!**

Regards,

Lynda Rosenthal

Lynda Rosenthal
Senior Vice President and General Manager
Executive Programs

Joseph L. Levy

Joseph L. Levy
Group Publisher and President

Constantly Making Change...Happen

By Carol Hildebrand

When it comes to change, many CIOs find themselves serving two conflicting masters

More than ever, companies regard IT as a strategic tool to reinvent organizations as global competitors. And as leaders of a company's strategic technology direction, CIOs are at the hub of corporate change. Yet IS executives must also manage the day-to-day details of implementing such visions.

"If your eyebrows aren't raised in confusion and curiosity by now, you don't realize what's going on," says **Warren Bennis**, Distinguished Professor of business administration and founding chairman of The Leadership Institute at the University of Southern California.

With such a balancing act to perform, IT professionals must first redefine their job responsibilities in order to lead corporate change. "Right now, there's too much of a credibility gap between the evangelist role and the day-to-day implementation role," says **Tom Davenport**, Curtis Mathes Fellowship Professor and director, information systems management program,

College and Graduate School of Business at the University of Texas at Austin.

IS executives need to start thinking about the business information that flows along technical conduits rather than the conduits themselves,

says Davenport. "Companies are looking for CIOs who understand the business and the role that information plays. The idea of technologists who can understand technology and implement it isn't enough anymore."

That's what **James J. Skinner Jr.**, vice president of systems at Swiss Reinsurance Co., discovered when his staff started implementing a paperless office environment based on workflow software. "The big change-related issues aren't technical," he says. They lie instead in IT's ability to comprehend the way business information should flow throughout a company.

Fortunately for Skinner, he spent more than 15 years on the user side of the house, doing stints in departments as varied as marketing and underwriting. "I know many of the functions and can relate to the problems they have," he says. "My message is always that the more you know about your business, the better. You cannot talk somebody



**"If your eyebrows
aren't raised in confusion
and curiosity by now,
you don't realize
what's going on."**



into how good IT can be. It has to come from them."

And for a technical imperative to be driven by users, it must first answer users' increasingly pressing need for quick access to timely knowledge, says Davenport. CIOs "must take a leadership role in creating a knowledge and information-based culture. Think about how the workforce makes information-based decisions and encourage people to gather, share and act on information. Try to hire people who are information and knowledge seekers, instead of all tech, no talk."

Management guru **Peter F. Drucker** says that corporations will develop entirely new business systems to measure the cost and performance of their own enterprises and that these systems will not come out of information technology. Rather, he says, "they require new managerial concepts." Today's methods of measuring the worth of a company are completely obsolete, he says, since they ignore one of the most vital assets of a company doing business in the Information Age: intellectual capital.

As companies learn to count the worth of ideas rather than general ledger items, Drucker says he expects to see the accounting function blend into the role of the

CIO. "In ten or 15 years, organizations will have only one information officer and one information system, where today they have two," he says — "the chief accountant in charge of our oldest system and the CIO in charge of the new information technology."

**"Try to hire people
who are information
and knowledge
seekers, instead
of all tech, no talk."**

Laws of Nature

One thing, however, remains constant: In order for a CIO to understand his or her corporate role as a change agent, he or she must first understand the nature of both leadership and change, both in the company and personally. From managing the CEO's expectations to defusing resistance to new technical projects, leading change in IT means far more than deciding on a new architecture for the company.

Bennis says that CIOs should first understand the profound difference between leadership and management. "Leaders are people who do things right. Managers are people who do the right things. There's a profound difference. When you think about doing the right things, your lexicon becomes one of missions, visions, strategic intent, purpose. But when you think about doing things right, you think about how-to. Leaders ask the what and why question, not the how question. Leaders think about empowerment, not control. And the best definition of empowerment is that you don't steal responsibility from people."

Such ideas may seem hard to swallow — but then, that's the nature of change. Humankind nearly always balks when confronted with a move from the status quo; visionary CIOs will grasp this unique opportunity to simultaneously transform their jobs and their companies.

Carol Hildebrand is a senior writer at *CIO Magazine* and can be reached at cjh@cio.com.

CIO

Leading the Charge in Turbulent Environments: IT as a Change Agent



Leaders to the Core

Warren Bennis divides leadership skills into four core competencies. Interestingly, not one of them is labeled, "Must have MBA and/or good number-crunching skills." Instead, Bennis emphasizes people skills. The four categories comprise some uncomfortably squishy stuff:

One
Provide direction and meaning to a corporate effort.

Two
Generate and sustain trust among employees

Three
Become purveyors of hope and optimism

Four
Have the capacity to convert purpose and vision into action and results.

"They must inspire people both in their heads and in their hearts," says Bennis.

Conference Agenda

Sunday, March 23

3:00pm - 6:00pm

Conference Registration

7:00pm - 9:00pm

Welcome Reception

9:00pm - 12:00am

Hospitality/Networking

9:00pm - 12:00am

Cyber Café

Hosted by Hewlett-Packard Company

Monday, March 24

6:30am

Fiscally Fit 5K Run

Hosted by Hyperion Software

7:30am - 8:15am

Breakfast

8:15am - 8:20am

Welcome & Opening Remarks



Joseph L. Levy
Group Publisher
and President
CIO Communications, Inc.



This author's most recent book will be distributed at the conference.

8:20am - 9:30am

First, Change All the Rules



Dr. Jim Wetherbe
Director
MIS Research Center
University of Minnesota
Federal Express
Professor of Excellence
Director
Center for Cycle
Time Research
University of Memphis

FedEx is the world's first service organization to receive the coveted Malcolm Baldrige Award and is touted as one of the top four corporations to work for in the U.S. What business-process changes were necessary for FedEx to consistently, absolutely, positively provide on time service every time? The 11 principles that guide this corporation and make it successful can be deployed by every organization, every IS function and every employee.

9:30am - 10:15am

A CIO's Vision of the IT Forest Through the Trees



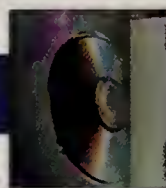
James J. Skinner Jr.
Vice President
Systems
Swiss Reinsurance
America Corporation

In its demand for rapid recovery and response times, efficient processes and a requirement for global strategies, the insurance industry is driven by technology. Skinner will discuss why Swiss Reinsurance reengineered their information systems in contracts, claims and other worldwide departments and how they effected those changes.

10:15am - 10:45am

Coffee Break

To enroll, visit our Web site at <http://www.cio.com> or call 800-366-0246.



10:45am - 12:15pm

The People Side of Change: A CIO Roundtable

CIOs share specific techniques they have implemented in driving change.

Moderated by:



Abbie Lundberg
*Editor
CIO Magazine*

Panelists:



David E. Kepler
*Director of Global
Information Systems
The Dow Company*



Phil Newbold
*Former Vice President
and Director of
Information Technology
Services
Kaiser Permanente*



Debra Robinson
*Vice President
Information Systems
and Technology
Delaware North
Companies, Inc.*

Linda Wiersema

*General Manager of Information
Technology and CIO
LTV Steel*

Not all CIOs are well equipped to drive change. Because IS has an enterprisewide perspective, the use of technology can influence peoples' attitudes and behavior. Technology is the easy part — changing people's behavior is hard. The CIOs participating in this discussion, all of whom have led successful change efforts, will share specific techniques for driving change and offer lessons you can apply in your own organizations.

12:15pm - 1:30pm

Luncheon

1:30pm - 2:30pm

From Techno-Culture to Info-Culture



Tom Davenport
*Curtis Mathes
Fellowship Professor
Director
Information Systems
Management Program
College and Graduate
School of Business
University of Texas at Austin*

One reason IS groups have had difficulty in leading organizational change is their overemphasis on technology. The IS techno-culture creates a barrier between IS and its customers. As an alternative to a technically-oriented culture, many IS groups are beginning to adopt information- and knowledge management-oriented cultures. This presentation will give examples of those organizations and specific steps to achieve an info-culture and take a leadership role in information-driven organizational change.

2:45pm-3:30pm

Concurrent Sessions

3:30pm-4:00pm

Coffee Break

4:00pm-4:45pm

Concurrent Sessions — Repeated

6:30pm - 8:00pm

Reception

8:00pm - 12:00am

Hospitality/Networking

8:00pm - 12:00am

Cyber Café

Hosted by Hewlett-Packard Company

Tuesday, March 25

7:00am - 8:00am

Breakfast

Measure Your 10 Critical Change Skills

A Change-Map (C-Map) survey will be distributed to you at registration. Fill it out and self-score it at your leisure... bring it to the "Mapping Your Route Through Change" session on Tuesday morning...you'll see how change affects you!

8:00am - 9:30am

Mapping Your Route Through Change



Bob De Filippis
*President and CEO
Career Partners
International*

To capitalize on the opportunities that come with change, we must discover how to lead and manage ourselves — as well as our teams — with our own personal "repertoire of change management skills." This session will allow you to examine your change management capabilities through personal responses to ten critical change skills through the Change-MAP (C-MAP) survey; you will be guided through the analysis of your responses and development of the action steps to improve your change management competencies.

9:30am - 10:15am

Information — Corporate Asset



Dr. William Limond
*Group Director
Information Services
British Gas PLC*

Bill Limond is a proponent of Peter Drucker's maxim on information management, "In the end, the only thing we have to manage is information itself." To meet the challenges of the future, CIOs must lead change in dramatic ways. Limond will discuss

Leading the Charge in Turbulent Environments: IT as a Change Agent

the evolving role of IT and IT management in global enterprises. He will also examine the information and cultural gaps in the IT arena. In this session you will learn the initiatives and processes British Gas used to meet customer demand for information.

10:15am - 10:45am

Coffee Break

10:45am - 11:30am

Concurrent Sessions

11:45am - 12:30pm

Concurrent Sessions — Repeated

12:30pm - 1:30pm

Luncheon

1:30pm - 2:15pm

Concurrent Sessions

2:30pm - 3:15pm

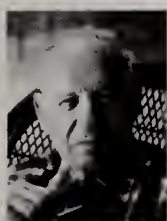
Concurrent Sessions — Repeated

3:15pm - 3:30pm

Coffee Break

3:30pm - 5:30pm

Pinnacles of Management and Leadership



Peter F. Drucker
*Clarke Professor of Social Science and Management
Claremont Graduate School*



Warren Bennis
*Distinguished Professor of Business Administration
Founding Chairman
The Leadership Institute
University of Southern California*

Peter F. Drucker, the world's premier management guru, and Warren Bennis, leadership scholar and authority, will join intellectual forces for two solid hours. They will each offer views on

successfully driving organizations into the next century. This session will feature individual presentations, a dialog and questions from the audience. Don't miss this opportunity to tap into over 100 years of excellent management theory and practice.

5:30pm - 7:00pm

Reception with Peter Drucker and Warren Bennis

7:00pm - 12:00am

Hospitality/Networking

7:00pm - 10:00pm

Executive Bay Cruise with Dinner

Hosted by Sun Microsystems, Inc.

7:00pm - 12:00am

Cyber Café

Hosted by Hewlett-Packard Company

Wednesday, March 26

6:30am

Fiscally Fit 5K Run

Hosted by Hyperion Software

7:15am - 8:00am

Breakfast

8:00am - 9:00am

The High Cost of Mistakes



Jack Trout
*President
Trout & Partners
Author
The New Positioning*

Today's turbulent times are dominated by one word: competition. If you make a mistake in today's marketplace, your competitors quickly take your business — and you won't get it back. This session will discuss how to avoid mistakes and will give insights into where all marketing wars are fought: the mind.

Packed with insight, analysis and irreverent advice, Trout's presentation will allow you to better understand which companies win and which ones fail in a world where everyone is after everyone else's business.

9:00am - 10:00am

The Quest for Knowledge



John Dahms
*CIO
Central Intelligence Agency*

As the world becomes wired and the Global Information Infrastructure matures, the amount of information available through open sources explodes. The CIA, in concert with the U.S. intelligence community, is pursuing a strategy of using the Internet, intranets and extranets to capture real knowledge in a sea of information. This session will detail how executing this strategy requires the CIA to reengineer its information service delivery mechanisms.

10:00am - 10:30am

Coffee Break

10:30am - 12:00pm

How to Ride the Wave of Hypercompetition...Without Wiping Out



Richard D'Aveni
*Professor
Amos Tuck School of Business Administration
Dartmouth College
Author
Hypercompetition*



Eileen Shapiro
*President
The Hillcrest Group, Inc.
Author
Fad Surfing in the Boardroom*

D'Aveni and Shapiro agree that dominance cannot be accomplished by sustainable competitive advantage.

To enroll, visit our Web site at <http://www.cio.com> or call 800-366-0246.

D'Aveni tells about four arenas of competition and how players seize initiatives by creating major disruptions. He argues that the need to win requires a series of disruptive unsustainable advantages. Shapiro warns of self destruction without proper self-management. Expect a challenging, humorous and thought provoking session!

12:00pm-12:15pm
Closing Remarks
 Jim Wetherbe

Concurrent Sessions

Each Corporate Host will provide a concurrent session, which will be offered twice. You will be able to attend a maximum of six sessions during three time blocks on Monday and Tuesday.

Maximizing the Return on Your Decision Support Investments



John W. Finnell Jr.
 Manager
 Decision Support
 Integration Laboratory
 Acxiom Corporation

Today's rapidly changing decision support system landscape poses especially difficult challenges to those responsible for adopting technology standards for an organization. Trade-offs must be made between the value added from new technologies and maximizing previous investments. This session will explore methods Acxiom Corporation uses to deploy new decision support systems and open systems technologies while maximizing functional value and ROI for existing systems.

IT Solutions for the 21st Century That You Can Use Now



Christopher J. Oliver
 Director of Engineering
 and Manufacturing
 Cabletron Systems, Inc.

Much industry banter today deals with so-called "network computing" — a concept which promises that the large, costly and more complex IT investments will be centrally located and allow for simpler, less expensive network computers to be on every desktop. In fact, the network computer is really the 21st century equivalent to the 1960s terminal mainframe architecture. This presentation will explore network planning strategies and detail the positioning of a cable and resilient switch-based information transportation network to connect the enterprise using intranet and Internet technologies.

IT Will Never Be the Same Again



Alex Mendez
 Vice President of
 Enterprise Marketing
 Cisco Systems, Inc.

Computer networks are seen as a key enabler to delivering improved productivity, communication and automation. How can today's enterprise networks be leveraged to reduce project cycle times, lower operational costs and speed time to market? This presentation will examine key business and technology trends and why an effective IT and networking strategy is a corporate imperative. The session will also outline keys to developing a standardized IT environment that enable cross-platform applications, computing and service customization. Mendez will also weigh the different factors such as risk, performance, cost, time and control, that play a central role in the decision to outsource or insource the enterprise network.

Transforming IT: Managing Continuous Change in Turbulent Environments



James J. Ryan
 Vice President
 Information Manage-
 ment Group and CIO
 Data General Corporation

New computing waves come so quickly that most enterprises are slow to integrate new technologies into their daily operations. In the same time it takes to implement new systems and business processes, an enterprise could find itself behind the curve. How can you implement new systems to take advantage of the next technology without putting today's business in peril? This session presents strategies for surviving continuous change in turbulent environments using the real-world example of change management at Data General Corporation.

Truth or Dare: IT as a Change Agent



Tom Martin
 Vice President
 Large Corporate
 Accounts Marketing
 Dell Computer Corporation

Can IT planning, deployment and transition activities be transformed from expensive, slow-moving processes into manageable, economical projects? Are standard computing environments really achievable? This session will illustrate how organizations that have adopted a life cycle cost philosophy are better equipped to meet global business needs while leveraging the most applicable technologies and saving millions of dollars in the process.

Leading the Charge in Turbulent Environments: IT as a Change Agent

A Concurrent Session will also be presented by:



Robert R. Walker
Vice President and CIO
Hewlett-Packard Company

The IT Revolution: Empowering IT as a Catalyst for Change



Sandra Moran
Senior Director
Hyperion Software

Successful IT organizations are implementing an approach that views the user community, IT and vendors as business partners. In this scenario, the success or failure of the corporate strategy is directly related to IT's ability to provide an information infrastructure that supports rapid organizational change. This session will discuss the tools that IT needs to provide a flexible information infrastructure to meet critical business goals and capitalize on a company's information assets.

A New Face in Terrorism



John E. Nevola
Manager
Service Delivery
North America
Business Recovery
Services
IBM Global Services

This presentation will discuss the shift in thinking about disaster probability and contingency planning. In the past, businesses based their contingency plans mainly on natural events. Recently, terrorist activity has increased and appears to be posing an ever growing threat to the lifeblood of the business community. This new threat has earned more consideration in the development of contingency

plans. The presentation will detail past terrorist activity, the increasing threat of terrorism—both internationally and domestically, and suggest some preventative measures businesses can implement to mitigate the probability and impact of a terrorist attack.

Trends in Technology



Malcolm Colton
Director of Database
Marketing
Informix Software, Inc.

The World Wide Web is an excellent example of the need for complex data support. Informix-Universal server is the first commercial object relational data management system to combine industrial-strength OLTP, OLAP and infinite extensibility through DataBlade class libraries into a single DBMS engine. This session will discuss the applications for extensible object technology and how to develop, build and deploy DataBlades.

Strategic Inflection Points: IT's Role in Navigating Turbulence



Claude Wimberly
Director
Field Enterprise
Programs
Intel Corporation

This presentation will focus on what Intel's IT organization is doing to anticipate and react to the rapid changes and potential "strategic inflection points" that face Intel and other businesses. Andy Grove's recent book, *Only the Paranoid Survive*, describes strategic inflection points as times when the balance of forces affecting a business or industry shift from the old ways to a new way of doing business and competing. Those companies who best anticipate and adapt to these ways survive and thrive. IT can play a huge role in anticipating and reacting to business turbulence.

Breaking Through the Application Development Barrier with Best Practices



Rick J. Pleczko
Senior Vice President
Product Marketing
and Development
LBMS, Inc.

For years we have been told that application development is too slow, produces poor quality, costs too much and gets in the way of business initiatives. Now we hear about IT organizations that are leading the charge, delivering better solutions, enabling rapid business change and achieving and sustaining breakthrough levels of performance. This session will examine how organizations are implementing process management to dramatically improve performance in a turbulent environment.

Integration on the Run



Cully Culbreth
Director
Integration and
Consulting Services
Access Graphics, Inc.

Courtesy of Lockheed Martin Corporation

With a growth rate of nearly 50% per year, Access Graphics has had to take dramatic steps to keep up with business demands. As a result, the company is replacing its enterprise-wide information system to improve interoperability of several vital business applications, including order entry, purchasing, inventory, marketing and customer database. This session will focus on the importance of addressing cultural change in the implementation of new technology affecting the enterprise and using tools that enable communications and value-added processes throughout the life of the project.

Business Capable Networks



Carl Pavarini
*Vice President
Small Business Markets
and New Business
Development
Lucent Technologies*

The rapid pace of business is causing IT professionals everywhere to continually examine their voice, data and multimedia networks. This session will examine the forces changing the marketplace as well as their effects on today's networking and present a plan that IT professionals can follow to help their companies realize "future-proof" business-capable networking.

Minimizing Your Professional and Personal Risk as the CIO Change Agent



David P. Rodgers
*Vice President
Corporate Architecture
Sequent Computer
Systems, Inc.*

CIOs face two kinds of risks as change agents: personal, including stress, job carryover into the home life and personal relationships that extend beyond the workplace; and professional, including career progression, potential impact on a resume and professional recognition. This session will explore a multitude of opportunities to enhance your success as a change agent and minimize your personal or professional risk. Rodgers will reveal numerous examples from real-life situations that he has encountered during his career as a technology strategist, visionary and vice president of corporate architecture.

Leadership in the Trenches of IT



Paul Lawryk
*Group Manager
Market Development
North America
Sun Microsystems, Inc.*



Maynard Webb
*Vice President and CIO
Bay Networks, Inc.*

Lawryk will discuss leadership trends of breakthrough thinkers in the IT world and show some original research from 100 CTOs and CIOs about how they secure, develop and interoperate heterogeneous enterprises in turbulent environments. Webb will tell how he implemented the most complex set of mission-critical and distributed applications in record time.

EMCON 2000: A Program Management Experience



Cindy Stoddard
*Director
Information Systems
Emery Worldwide*

Courtesy of Texas Instruments, Inc.

Emery Worldwide has embarked on a multiyear effort to reengineer all its core business applications using a component-based development approach. This is being accomplished through its own efforts and direction and without assistance from third-party integrators. This presentation will share the experiences and lessons learned in the process. Topics include company background, program history, strategies, challenges, program governance, and methods and tools.

SmartVideoconferencing — End-User Training... Without the Travel



Tom Stevenson
*Vice President of
Marketing and Strategy
VTEL Corporation*

So you've made the move to client server and are pushing forward with your corporate intranet. How are you going to train all those end-users on the new software applications? Come hear how other large companies have trained the masses using a videoconferencing system that's also a PC. Instructors can work through real software exercises with end-users while they get hands-on time at their own desktop or in a centralized location at their workplace.

Concurrent Sessions will also be presented by:

Centura Software Corporation

Computer Associates
International, Inc.

Ernst & Young LLP

Leading the Charge in Turbulent Environments: IT as a Change Agent

Companion Program Agenda

Sunday, March 23

3:00pm - 6:00pm
Conference Registration

7:00pm - 9:00pm
Welcome Reception & Registration

9:00pm - 12:00am
Hospitality/Networking

9:30pm - 12:00am
Cyber Café
Hosted by Hewlett-Packard Company

1:30pm - 5:30pm
San Diego by Land and Sea Tour

6:30pm - 8:00pm
Reception

8:00pm - 12:00am
Hospitality/Networking

8:00pm - 12:00am
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Hosted by Hewlett-Packard Company

5:30pm - 7:00pm
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7:00pm - 10:00pm
Executive Bay Cruise with Dinner
Hosted by Sun Microsystems, Inc.

7:00pm - 12:00am
Cyber Café
Hosted by Hewlett-Packard Company

Tuesday, March 25

7:00am - 8:00am
Breakfast with conference participants

10:15am - 10:45am
Coffee Break

12:30pm - 1:30pm
Luncheon with conference participants

3:15pm - 3:30pm
Coffee Break

3:30pm - 5:30pm
Keynote session with Peter Drucker and Warren Bennis

Wednesday, March 26

6:30am
Fiscally Fit 5K Run
Hosted by Hyperion Software

7:15am - 8:00am
Breakfast with conference participants

10:00am - 10:30am
Coffee Break

Monday, March 24

6:30am
Fiscally Fit 5K Run
Hosted by Hyperion Software

8:30am - 9:30am
Stretch & Tone Class

9:30am - 10:30am
Companion Breakfast

12:15pm - 1:30pm
Luncheon with conference participants

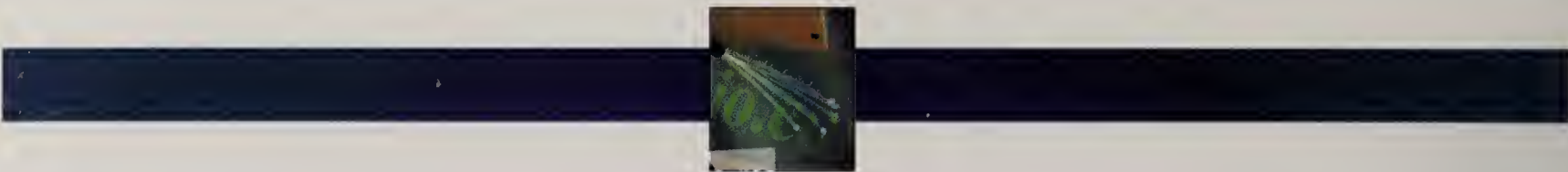


Sheraton San Diego Hotel & Marina

Nestled at the water's edge on enchanting San Diego Bay, the Sheraton San Diego Hotel & Marina is ideally situated at the heart of a premier California destination. Offering majestic panoramic views of the Bay and downtown San Diego, the 1,050-room hotel complex offers easy access to the airport and to numerous area attractions and recreational opportunities.

Widely recognized for its rare blend of scenic elegance and a total preoccupation with service, the recently refashioned property offers a breathtaking tropical environment that captures the true flavor of its dramatic waterfront surroundings.

To enroll, visit our Web site at <http://www.cio.com> or call 800-366-0246.



ACXIOM

Acxiom Corporation builds data warehouses for clients whose businesses depend on scope, accuracy and accessibility of customer information. Using a unique matrix of services, software and tools that transform data into customer knowledge, multiple internal databases are integrated with external information to drive powerful, knowledge-based decision support applications. With expertise in industries such as retail, banking/finance, insurance and telecommunications, Acxiom helps clients better understand their customers, build effective acquisition and retention programs, reduce response time and improve customer service.

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We make the things that make communications work.... Lucent Technologies, Inc. combines the systems and technology units that were formerly a part of AT&T with the research and development capabilities of Bell Labs. Its mission is to provide customers with the world's best and most innovative data and communications networking systems, products, technologies and customer support. Fueled by excellent people, Lucent Technologies began its new life in 1996 as a Fortune 40 company.

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Companions must be enrolled in this program to attend any conference-related functions. Includes all scheduled meals, receptions, entertainment, companion breakfast, stretch and tone class, and a scenic San Diego by Land and Sea Tour. Conference session attendance not included.

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HOTEL ACCOMMODATIONS

A block of rooms has been reserved at the Sheraton San Diego Hotel & Marina. We urge you to make your reservations early by calling the hotel at 619 692-2265. Be sure to identify yourself as part of the CIO conference to receive the conference rate. Please make your reservations early and guarantee your room with a credit card, as all unreserved or unguaranteed rooms will be released on February 23, 1997. Hotel reservations/cancellations and charges are your responsibility. CIO will make hotel reservations for government/military participants only.

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American Airlines is the official conference carrier. Call American at 800 433-1790 and reference Star File #S1237MA. AVIS is the official car rental provider. Call AVIS at 800 331-1600 and reference B766657.

ENROLLMENT FEES

All enrollment fees must be paid in advance of the meeting. Fee includes general conference sessions, concurrent sessions, corporate host displays, conference materials and scheduled meals. Transportation, hotel and recreation are your responsibility.

CANCELLATION

You may cancel your enrollment up to March 7, 1997 without penalty. No refund or credit will be given for cancellations received on or after March 7, 1997. You may send a substitute in your place.

CIO reserves the right to decline enrollment of any registrant.

CIO

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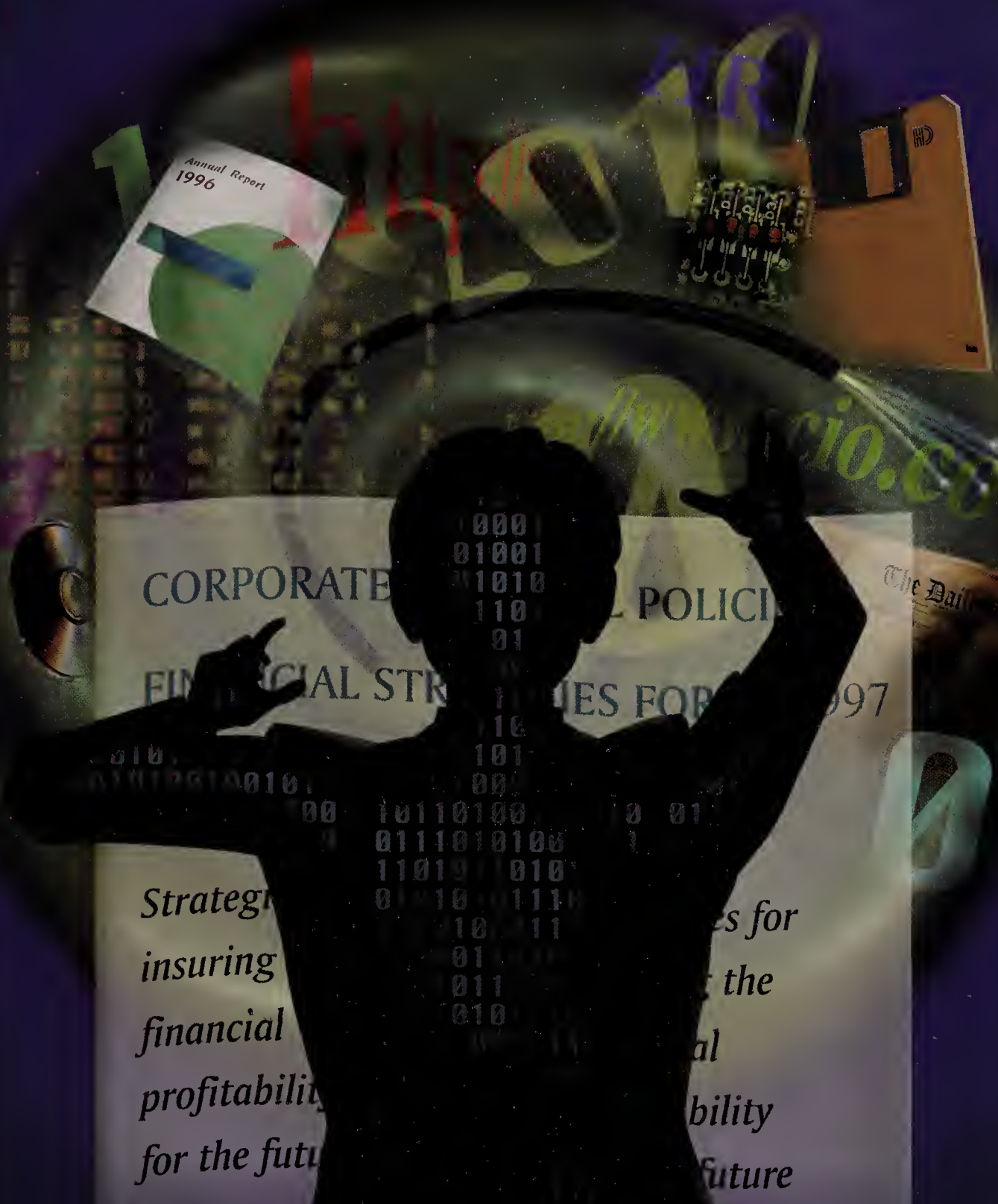
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Leading the Charge in Turbulent Environments IT as a Change Agent

Featured Presenters

Warren Bennis • Peter Drucker • Jack Trout

Publisher's Note

Five years ago, we set out to recognize CIOs and their business partners who, through collaboration and innovation, have demonstrated return on investment from the implementation of information technology. But we realized something along the way: Traditional ROI metrics fail to measure the total value a system can deliver. Business value comes in many flavors, and the Enterprise Value Award has evolved to take into consideration more than just bottom-line ROI.

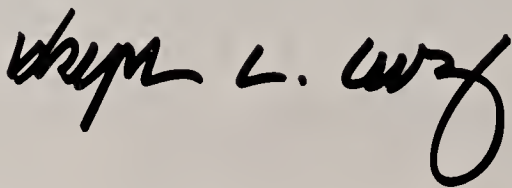
This year's awards were given to those organizations that could show how their technology investments helped further their organizations' strate-

gic objectives, that IT was key to achieving the overall business solution and that collaboration between the business unit and IS organization existed throughout the project.

This week, we will honor the recipients of the fifth Enterprise Value Awards at the CIO Enterprise Value Retreat in Dana Point, Calif. And although we recognize those who envisioned and implemented innovative system solutions, I would also like to pay tribute to the companies that supplied the technology.

Within each Enterprise Value Award feature, you will find a related section of information detailing the hardware, software, network and architecture of each winning system. The technology vendors mentioned in those sections represent the backbone of the Enterprise Value Awards. It was their innovative products and services that enabled organizations like Bell Atlantic Corp. and The Chase Manhattan Corp. to create their winning systems.

The Enterprise Value Award recognizes collaboration for business value. I'd like to think that it's not just between the CIO and the business unit but also the partnership between a company and its technology vendor. So, congratulations to both the winning companies and their vendor partners.



P.S. Be sure to join us March 23-26 at the next CIO Perspectives Conference, "Leading the Charge in Turbulent Environments," in San Diego. The conference will address the multiple drivers and aspects in the change process including technological innovation, rightsizing and economic influences as well as the human factors, such as leadership dynamics, communication challenges, behavioral impact and implementation. For more information, call 800 366-0246 or visit www.cio.com.

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Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by Cheryl Dahle

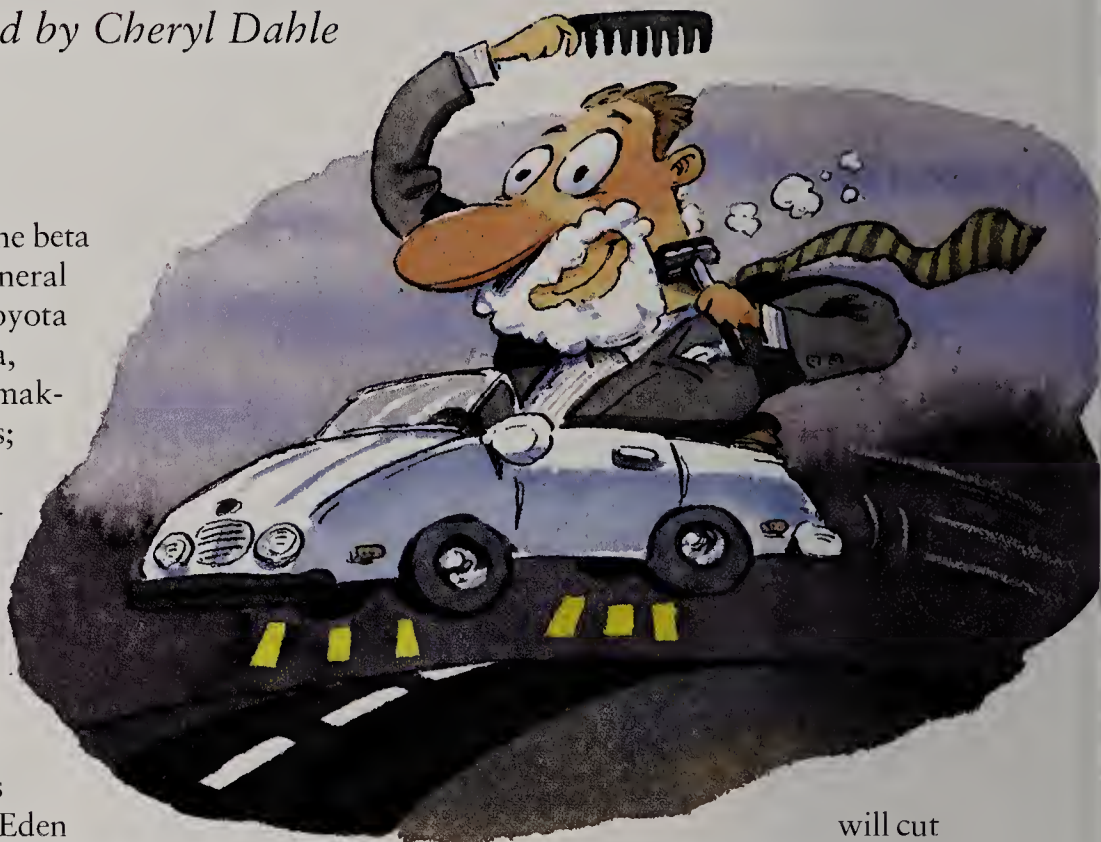
Look, Ma! No Hands

AUTO PILOT If you're one of those radio-fiddling, change-fishing, lipstick-applying, newspaper-reading drivers who runs the rest of us off the road, boy, do we have a technology for you. A group of car makers and the National Automated Highway System Consortium (NAHSC) are testing technology in San Diego that will allow motorists to leave the trivial stuff, like, say, driving, to the car itself so that they can attend to more important matters, like finding the newest Jacko tune on the airwaves.

In a week-long, no-hands driving demonstration next August, 20 vehicles, including cars, a minivan and a municipal bus, will hurtle down the highway steered only by onboard computers. Some of the vehicles will use sensors under their bumpers to follow a trail of magnets embedded along a 7.6-mile stretch of Interstate 15. Others will be equipped with cameras and radar that feed steering information to the car's computer. Companies in-

involved in the beta include General Motors, Toyota and Honda, which are making the cars; Houston Metropolitan Transportation, which is building the bus; and Delco Electronics Corp. and Eden Corp., which are designing the radar systems.

The \$20 million test will be paid for mostly by the federal government and managed by NAHSC. The information gleaned will bring the organization one step closer to having a national prototype to present to the U.S. Department of Transportation by the year 2002. Proponents of such technology say it



will cut down on congestion, accidents and pollution associated with stop-and-go driving. "When you consider that 90 percent of highway accidents are caused by human error, an automated highway system will save a lot of lives," says NAHSC representative Celeste Speier. Automated highways also will eliminate the need to build new lanes by allowing vehicles

More Flowers To Ya

BE MY VALENTINE We don't *usually* run personals in the Trendlines department. But your sweetie e-mailed us last week asking us to remind you to send flowers for that special day that falls in the second week of February. (We won't embarrass anyone by naming names. You *know* who you are.)

And don't let us hear you moaning about how difficult it is to find time for the florist when there are dozens of online services that make that excuse obsolete.

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Trendlines

to travel close together—safely—at high speeds.

Speier predicts automated highway systems won't be built for the general public for another 15 to 20 years (so there's plenty of time for you to hone or develop those bad driving habits). To accommodate control freaks who prefer to do battle personally with other morning commuters, the option to drive in manual lanes will still exist even when automated lanes become commonplace.

"There will be a gradual progression to automated highway systems," says Speier. "At first, there may be a 'driver alert' mechanism that allows the vehicle to know where it is within the lane boundaries. As the car starts to wander out of the lane, it would beep or shake the wheel. With an automated mode, the driver could be asleep and the car would drive itself. Once the vehicle knows where it is in the lane, it can keep itself in the lane."

Leaving you to devote your attention to that morning crossword.

—Jennifer Bresnahan

An Easier Route

The 1996 Olympics spawned the largest telecommuting experiment in history. With the influx of 2 million visitors to the 7-square-mile Olympic Ring in Atlanta, the city had to reduce the number of people commuting to work by **25** percent. Of the companies that tried telecommuting, **97** percent recommended telecommuting as an alternative after the Olympics were over. **70** percent of the workers said they were more productive; **62** percent said they were better able to focus on their tasks. And **98** percent of the companies plan to institute telecommuting on a permanent basis in the future.

SOURCE: SYMANTEC CORP.

Not Well Groomed

UNWEDDED BLISS What could be more appealing than getting hitched in a Las Vegas ceremony at which a singing Elvis impersonator officiates, sexologist Dr. Ruth plays the flower girl and Microsoft Corp. foots the entire bill?

Staying single, apparently.

"No one took us up on the offer," laments Dee Dee Walsh, a product manager at Microsoft, which sponsored the event, dubbed GeekFest, during the most recent Comdex convention. "Maybe because the attendees were 99 percent male."

Despite that promising statistic, one Jen Parsons of Microsoft was unable to snag a mate at the event. She arrived in a wedding dress, full of hope, and left without taking a vow. Though there was no ring for this wedding belle, Walsh says Parsons' evening wasn't a total bust.

"We went out after the party, and she received tons of congratulations," Walsh says.

"No one even commented that she was missing a groom." ■



Supportable Portables

Help! The portables are coming! According to the Business Research Group, more than 20 million laptop computers will be in use by the year 2000. That means more remote workers and a bigger headache for IS. Fully 73 percent of IS managers and department heads surveyed by the BRG said supporting mobile workers would be a critical business issue for them in the future.

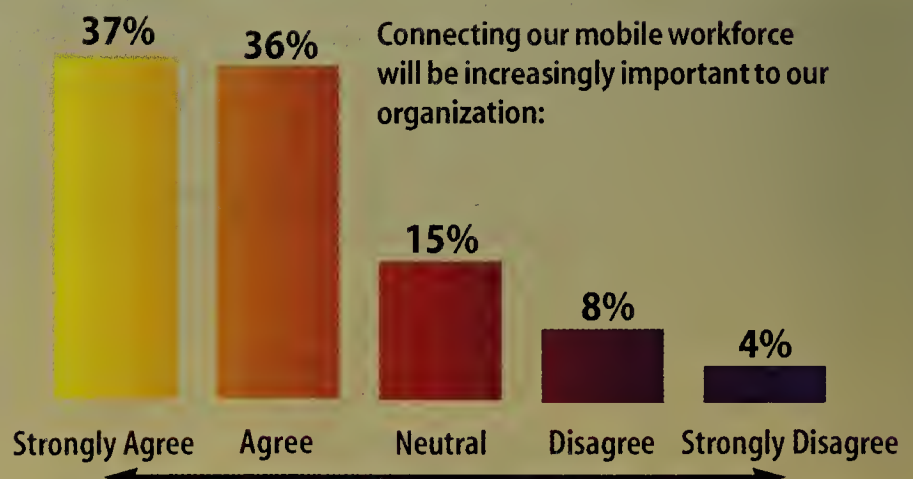
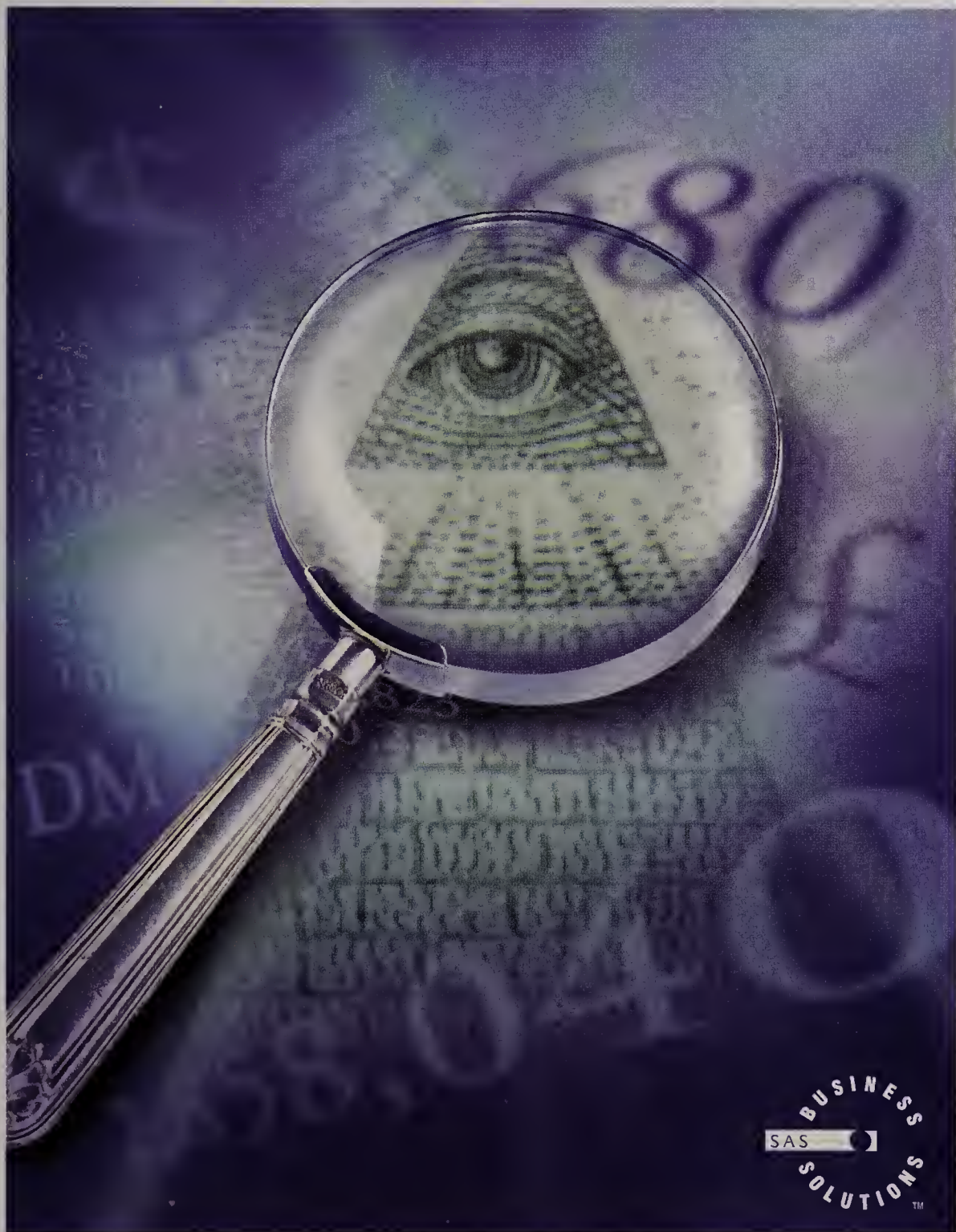


ILLUSTRATION BY JOAN HALL

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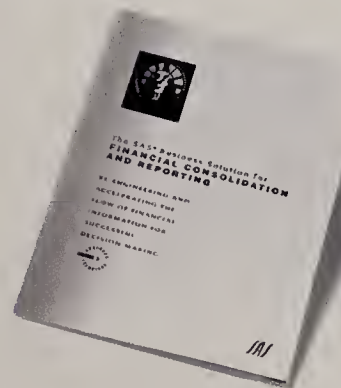
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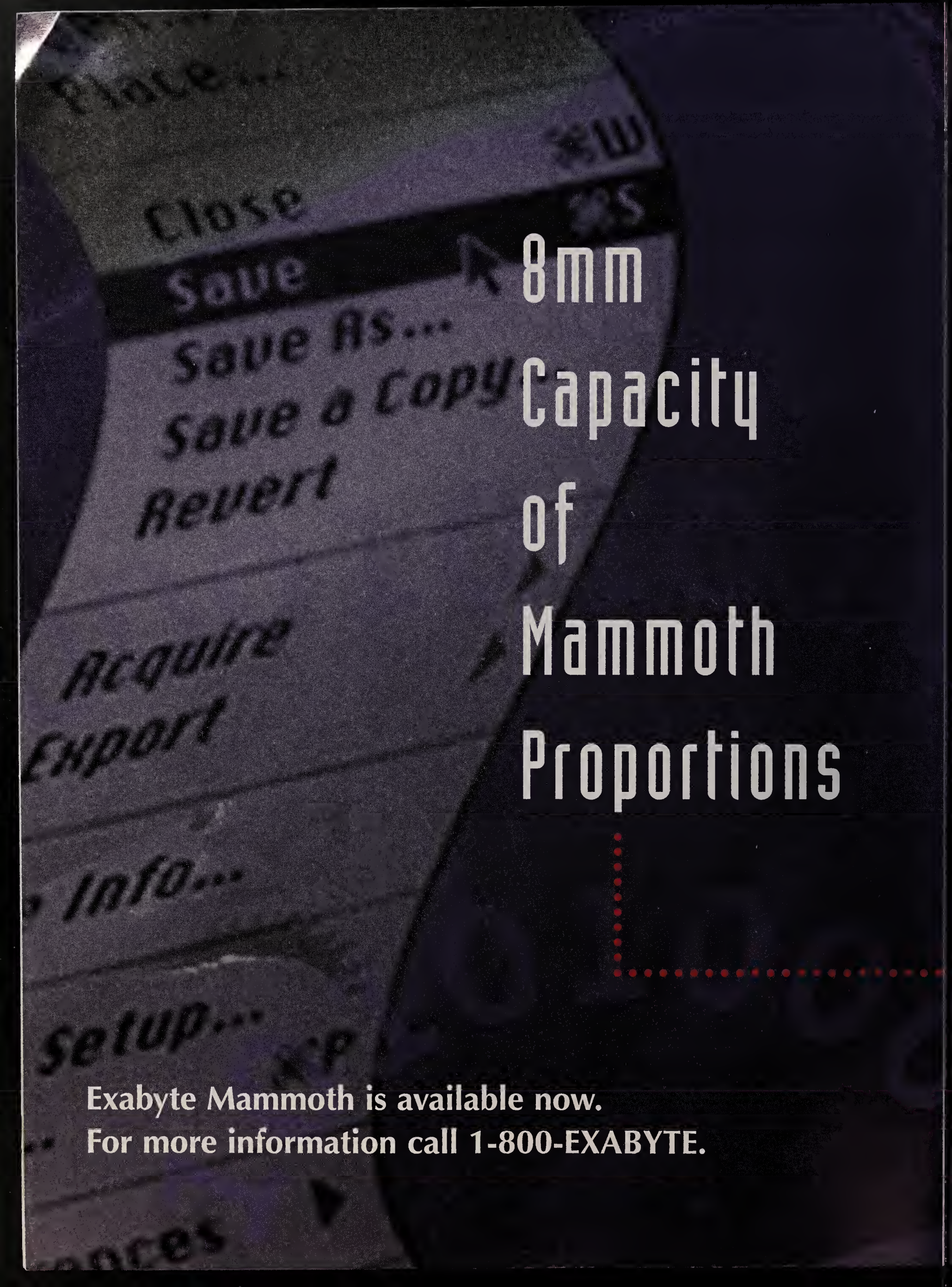
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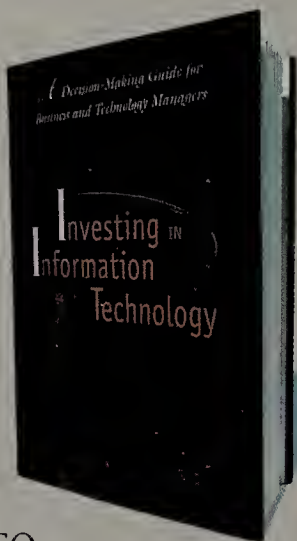
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Off the Shelf

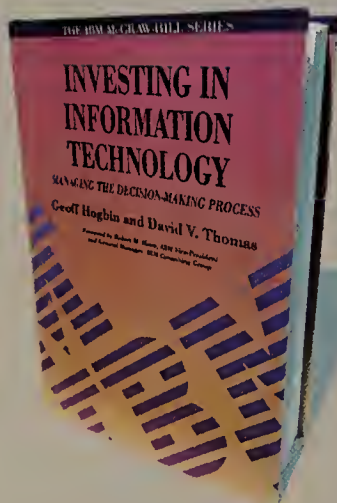
Round-Up: Measuring Corporate IT Investment Value

Hundreds of books about personal finance cram the business shelves of the typical bookstore, whereas just a handful of volumes about managing corporate investments in IT grace the stacks. Luckily, three out of four recent releases on the latter topic come highly recommended.

IS executives still struggling to communicate technology investment strategies to their CEOs will want copies of **Investing in Information Technology** (Van Nostrand Reinhold, 1996) for themselves and their bosses. This book is straightforward, well-grounded and surprisingly readable, although sometimes simplistic. Chapters alternate between authors Bill Bysinger, a former CIO, and Ken Knight, a CEO and former business school professor. For example, chapter nine gives Knight's practical advice about calculating payback periods, and chapter 10 gives Bysinger's viewpoint of cost-saving and profit-enhancing models for justifying IT spending. And you know the book is up to date when one of the many case studies demonstrates how one company calculated payback for its World Wide Web home page development project.



Be careful when picking up the Bysinger and Knight book that you don't accidentally purchase the similarly named **Investing in Information Technology: Managing the Decision-Making Process** (McGraw-Hill, 1994) by Geoff Hogbin and David V. Thomas, two IBM consultants. The book is extraordinarily dense and difficult to read. And the fifth chapter's summary of the groundbreaking IT investment metric method-



Continued on Page 28

Do You Hear What I Hear?

SONIC BOOM Audio technology developers have come up with a paradoxical invention that lets people hear better by hearing less. Called HyperSonic Sound, the development is being lauded as the biggest audio technology news since loudspeakers were invented in 1925.

In place of the big black boxes, woofers and tweeters of traditional speakers, the invention from American Technology Corp. of Poway, Calif., uses a silvery disk roughly the size of a cookie and covered with about a dozen piezoelectric quartz crystals, similar to those used in quartz watches. The crystals vibrate 1,000 times as fast as the sounding device in a traditional speaker, emitting sound waves that are too high for humans to hear. But when those waves interact, they form audible sounds.

The speaker's circular shape allows it to concentrate sound in a specific direction, so movie theaters, for example, might use it to replicate the sound of a jet landing or a heavenly choir. But several industries are looking to use the device's ability to "cancel out" noise. Auto makers are considering using its inaudible waves to drown out engine noise. And hearing-aid manufacturers could use the technology in its devices to eliminate background noise. ■

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pre-millennium change
syndrome."**

**-P.K. AGARWAL, CIO OF THE
FRANCHISE TAX BOARD FOR THE STATE
OF CALIFORNIA, AT AN N.A.S.I.R.E.
CONFERENCE IN PORTLAND, MAINE.**



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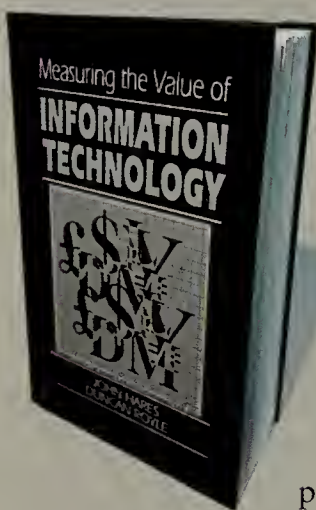
Trendlines

Off the Shelf

Continued from Page 26

ologies of Paul Strassmann, Jack Rockhart, Peter G.W. Keen and others leaves one hankering for more information.

A more complete investigation of cost/benefit analysis and investment appraisal techniques as they apply to IT investment decisions can be found in **Measuring the Value of Information Technology** (Wiley, 1994).



Ernst & Young consultant John Hares and accounting whiz Duncan Royle offer in-depth insight into investment and risk analyses that they say should be a part of every IT manager's daily life. The book has too many complex flowcharts, but it serves as a good refresh-

er course on how rigorous statistical methods can be applied to technology decision making.

For brand-new CIOs, there's another book worth buying. In **Doing IT Right** (Manning Publications, 1996), author Harold Lorin does a masterly job of explaining the cost-of-ownership issues in IT (chapter nine) and the due-diligence issues involved in IT investment decisions (chapter 10). A great guide to new technologies, the book contains discussions of tough topics like systems architecture and software infrastructure, which are at the heart of corporate America's IT investment dilemmas.



—E.B. Baatz

Big Pipe Dream

INTERNET INFRASTRUCTURE

You know what they say—you can never be too wide or have too much bandwidth. A group of universities is translating that maxim into action with a plan to build what is essentially a second Internet infrastructure dedicated to broadband educational use.

The ambitious project, dubbed Internet II, will create a leading-edge network for the national research community.



The network will enable a new generation of bandwidth-hungry applications, such as media integration, interactivity and real-time collaboration. The meganetwork of research and academic institutions is being hailed as a collaborative tool that could change the face of academia and lead to valuable research in multiple disciplines.

Institutions have embraced the project with an enthusiastic thumbs-up. Last October, Project Director Mike Roberts and other advocates met with 34 universities interested in becoming a part of the educational and technical venture. Roberts hoped that at least 20 would commit. But he got nods from all 34, and the number has since more than doubled.

Sponsoring universities have chipped in support staff “on loan” and funds for the project.

The estimated cost per university is expected to be as high as \$500,000 per year over the next several years, according to Heather Boyles, director of policy and special projects for the Federation of American Research Networks and spokesperson for Internet II.

Along with the charter universities, a number of federal agencies and many leading computer and telecommunications companies, including IBM, Cisco Systems, AT&T, MCI and Sun, are taking part in the project. President Clinton has announced that the federal government will participate in Internet II through the programs of its major research agencies, which will provide grant support.

Roberts warns that despite the immediate need and greed for bandwidth, the project will take at least five years to implement. “People are going to ask, ‘Why can’t we have this now?’” says Roberts. “At the working and organizational level, there’s going to be a lot of pressure, and we’re all going to need some patience.”

—Tom Wailgum

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Metric Systems *Edited by E.B. Baatz*

UNDERSTANDING THE VALUE OF YOUR I.T. ACTIVITIES

Software Economics 101

Studying the world's software development trends can help CIOs make the grade

BY HOWARD A. RUBIN

HOW MUCH SHOULD YOU spend to outfit a software development team in India? Will you get better service from a programmer in Russia or Japan? Are your Canadian code writers still productive, or would a Chinese company be a better option for you?

Maybe 10 years ago the information technology chief in a U.S. company didn't have to bother with such arcane questions. But today, CIOs everywhere must master global software economics. Why? Because nowadays, software development is proceeding across all time zones of the world 24 hours a day, seven days a week. The flow of development work from the United States and other Western nations to India and Russia and the movement of software products over the Internet illustrates software development's international scope. For CIOs who can understand and exploit that trend, fame and fortune await. For those who can't, disaster may be imminent.

Indeed, some pioneering IS executives in banking and telecommunica-

tions already are using their knowledge of global software and information technology economics to create internal free market software economies for their own companies. They are forming global software alliances, making strategic offshore investments in developing nations and, most importantly, carefully calibrating the cost and performance parameters of their global software development teams. Software development and maintenance work flows freely to whomever can deliver the most efficient and effective product regardless of time zone or national border. It's enough to make any Adam Smith devotee proud.

From an internal business viewpoint, the emerging need to manage software development teams in all corners of the globe will require companies to gather more refined development information and more accurate software metrics to support wise decision making and effective management. Alas, the traditional software metrics are woefully inadequate for the task of managing global software



development projects, although academia and corporate America are working to understand the status of software metrics and eventually to generate new numbers.

For example, in 1995 I conducted a study of global software engineering companies' performance along with researchers Ed Yourdon and Heidi Al-

POP QUIZ

Test your knowledge of global software economics

1. India and China employ the most software engineers in the world. True or false?
2. Which country has the world's most productive software engineers—the United States, Japan, Canada or India?
3. Which country charges the lowest rate for a three-minute international phone call?
4. What country do most global executives think does the best job of supporting business with its technological infrastructure?
5. Say a market basket of computer equipment and software (PC, printer, notebook, online subscription service and software suite) costs \$13,000 in the United States. In India, would the same setup cost \$5,000, \$13,000 or \$20,000?
6. Switzerland has the most telecommunications lines per capita. True or false?
7. If U.S. companies outsourced all their software development to low-wage countries like India and Russia, what percentage of the U.S. work could all those countries together handle?
8. Which country has the world's least expensive software professionals?

Answers: 1. False. The correct answer is the United States and Japan 2. Canada 3. Brazil 4. New Zealand 5. \$20,000 6. True 7. 30 percent 8. Russia

SOURCES: 1995 WORLDWIDE BENCHMARK PROJECT AND THE IMD 1996 WORLD COMPETITIVENESS YEARBOOK. COMPILED BY HOWARD RUBIN.

APPLICATION FORM



The 1998 CIO Enterprise Value Awards

*Honoring Business Achievement Through The
Innovative Use of Information Technology*

APPLICATION DEADLINE: JULY 1, 1997

Presented By:
CIO Communications, Inc.



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The 1998 Enterprise Value AwardsSM

CRITERIA

A panel of independent judges will choose winners from among entrants who have submitted completed application forms to *CIO* by July 1, 1997.

Entries will be judged on the following criteria:

- The extent to which the system adds business value in furthering the organization's strategic or operational objectives
- The measurable financial return the system provides to the organization
- The extent to which IT was key in achieving the overall business solution—the "couldn't have done it without technology" factor
- The quality of collaboration between the business unit and IS organization that is achieved throughout the course of the project

Each finalist will be subject to an in-depth analysis of the nominated system (to be performed by *CIO* or its agents). That analysis, which may require a site visit, will be based on interviews with sponsoring executives and system users and will be designed to substantiate all claimed benefits. Notification of winners will occur in October 1997. *CIO* reserves the right to publish relevant cost and savings figures that establish the claimed ROI of the system; the willingness to divulge that information for publication is a condition of entry.

DEFINING VALUE

We invite applicants to consider the broadest possible spectrum of enterprise value. The following list of IT-enabled benefits is intended to help guide applicants' thinking:

- new, innovative and more productive ways of doing business
- revamped organizational structures or styles of performing the work of the enterprise
- the ability of the enterprise to enter a new market
- successful global operation or expansion
- transformation of the way the enterprise competes within its customary market or of the terms of competition within the market

- improvement of the enterprise's relationships with its external customers
- improvement of the enterprise's relationships with its own employees or among its functions (such as marketing, finance or human resources)
- the ability of the enterprise to compete more effectively by adding to the sum of its available knowledge assets
- leaner and more economical operations

ENTRY GUIDELINES

- The system must have been operational prior to July 1, 1995.
- Entrants must agree to be featured, along with their systems and organizations, in a *CIO* article.
- Entries must be complete.
- The application form may be reproduced.
- Multiple entries from one company will be considered, but each entry must be submitted separately.
- Entries must be made jointly by the IS executive *and* the business sponsor for whom the system delivers value.
- IT vendors, public relations and advertising companies, consultants and other third parties may *not* apply on behalf of another company. They are encouraged to forward this form to the "owner" of the system or to contact *CIO* Communications to recommend that an application form be sent to the client.
- All entries must be computer-generated or typed; no handwritten entries will be accepted.
- Entries must be on 8.5-by-11-inch paper, one side per sheet.
- When feasible, an additional copy of the entry should be sent on a 3.5-inch disk. Electronic entries must be limited to word-processing and spreadsheet packages that are compatible with Microsoft Word and Microsoft Excel on a Windows or Macintosh platform.
- To view a complete sample application, or for more information on the Enterprise Value Awards, please visit our Web site at <http://www.cio.com/forums/EVA.html>.

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POSITIONING IT AS A BUSINESS ASSET

Yet the CIO Enterprise Value Award goes beyond recognition. It is an opportunity to provide hard, tangible facts about business value and ROI from information technology to the business community at large. It is an opportunity to demonstrate how partnering between business and technology executives can lead to the attainment of strategic objectives. By communicating the payback, CIO hopes to encourage other businesses to invest wisely in IT to ensure their survival in a fiercely competitive global market.

DO YOU QUALIFY FOR AN ENTERPRISE VALUE AWARD?

Four criteria are essential.

1. A return of value to the enterprise
2. A measurable financial return attributable to the system
3. The pervasiveness of information technology — in other words, the strategic objective could not have been met without IT's contribution
4. A collaboration between an IT and business executive

IF YOUR INNOVATIVE SOLUTION meets the criteria, please complete this Enterprise Value Awards application form. The Feb. 1, 1998, issue of CIO will feature profiles of the winning organizations and the executives who have proved that their technology investments have had a positive and sustained impact on enterprise value.

IN FEBRUARY 1998, CIO will host a special awards ceremony honoring the Enterprise Value Award winners at the annual CIO Enterprise Value Retreat. For more information, please contact Lisa Kerber at (508) 935-4449.

CIO ENTERPRISE VALUE AWARDS TIMELINE

APPLICATION DUE: July 1, 1997

JUDGES SELECT WINNERS: October 1997

WINNERS ANNOUNCED: October 1997

AWARDS CEREMONY: February 1998
at the CIO Enterprise Value Retreat
Ritz-Carlton, Laguna Niguel, Calif.

*1996 winners from
United HealthCare Corp.*



1. COMPANY/BUSINESS UNIT

name of parent company

city, state where headquarters are located

publicly or privately held?

annual revenues

industry

name of business unit or organization

city, state where located

number of employees at business unit

URL

2. ENTRANTS

A.

name of entering IS executive / system sponsor

title

name of division, department or unit

address

city

state

zip

telephone

fax

e-mail

B.

name of entering business-unit executive / sponsor

title

name of division, department or unit

address

city

state

zip

telephone

fax

e-mail

3. SUPPORTERS

Please list four people who are willing to be interviewed with regard to the system, its development, its use and the value returned. At least one should be a member of the technology team that developed the system and should have played a significant role. At least one should be a primary user from the sponsoring business unit. The other two may be from either organization or represent suppliers, customers or others intimately familiar with the system.

A.

name

title

telephone

fax

e-mail

reason for inclusion

B.

name

title

telephone

fax

e-mail

reason for inclusion

C.

name

title

telephone

fax

e-mail

reason for inclusion

D.

name

title

telephone

fax

e-mail

reason for inclusion

DEADLINE: JULY 1, 1997

Mail to: Enterprise Value Awards • CIO Communications, Inc.
492 Old Connecticut Path • P.O. Box 9208 • Framingham, MA 01701-9208

CONGRATULATIONS TO THE 1997 WINNERS OF THE ENTERPRISE VALUE AWARDS

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Business Systems*

BRUCE S. GORDON

*Group President
Consumer & Small Business Services*

The Chase Manhattan Corp.

DENIS O'LEARY

Executive Vice President & CIO

FRANK LOURENSO

*Executive Vice President
Middle Market Banking Group (MMBG)*

Fidelity Investments

ALBERT AIELLO

CIO

President, Fidelity Investments Systems Co.

STEVE AKIN

President

Fidelity Retail Customer Services

MacGregor Medical Association

JIM SLOANE

Director of Information Technology

LAURA B. COOK

Chief Quality Officer

Schlumberger Ltd.

DAVID P. SIMS

Technical Manager

VICTOR E. GRIJALVA

*Executive Vice President
Oilfield Services*

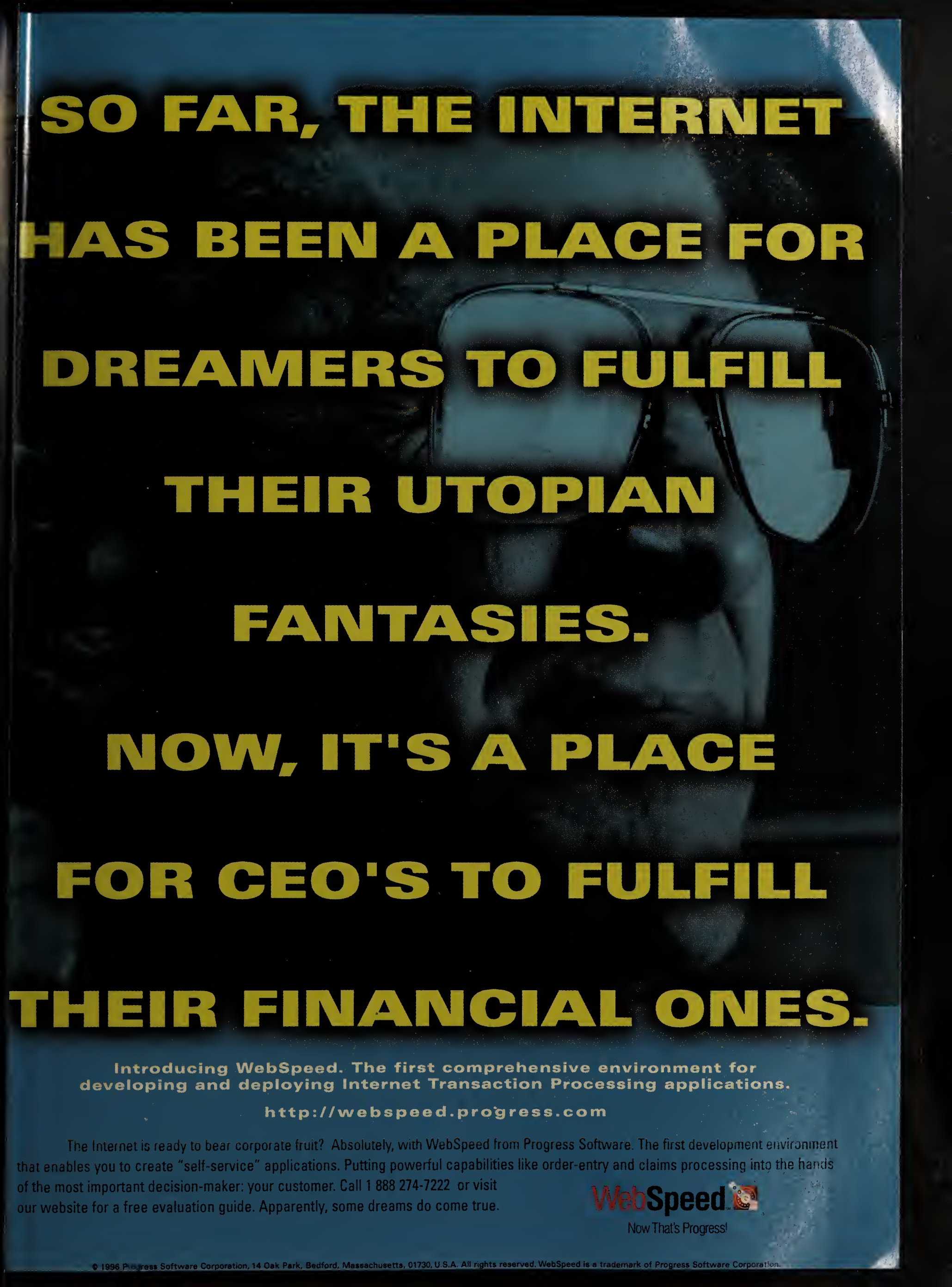
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INVESTMENT INSIGHTS

The Pentagon Programs

The Feds release cash-flow projection software to the general public

MAKING TOUGH technology investment decisions has just gotten a little easier, thanks to an innovative management tool developed by the Pentagon. The software, known as TurboBPR by the government and now available to consumers as BizCase, allows IS executives to rank investment alternatives by making risk-adjusted discounted cash-flow projections. The software tightly links strategic plans, mission objectives, cost/performance and investment alternatives. It was developed by Mike Yoemans, director of functional process improvement at the Pentagon, under the guidance of former Defense Department CIO Paul Strassmann. More than 10,000 copies of TurboBPR have been downloaded by state, local and federal government managers since 1994.

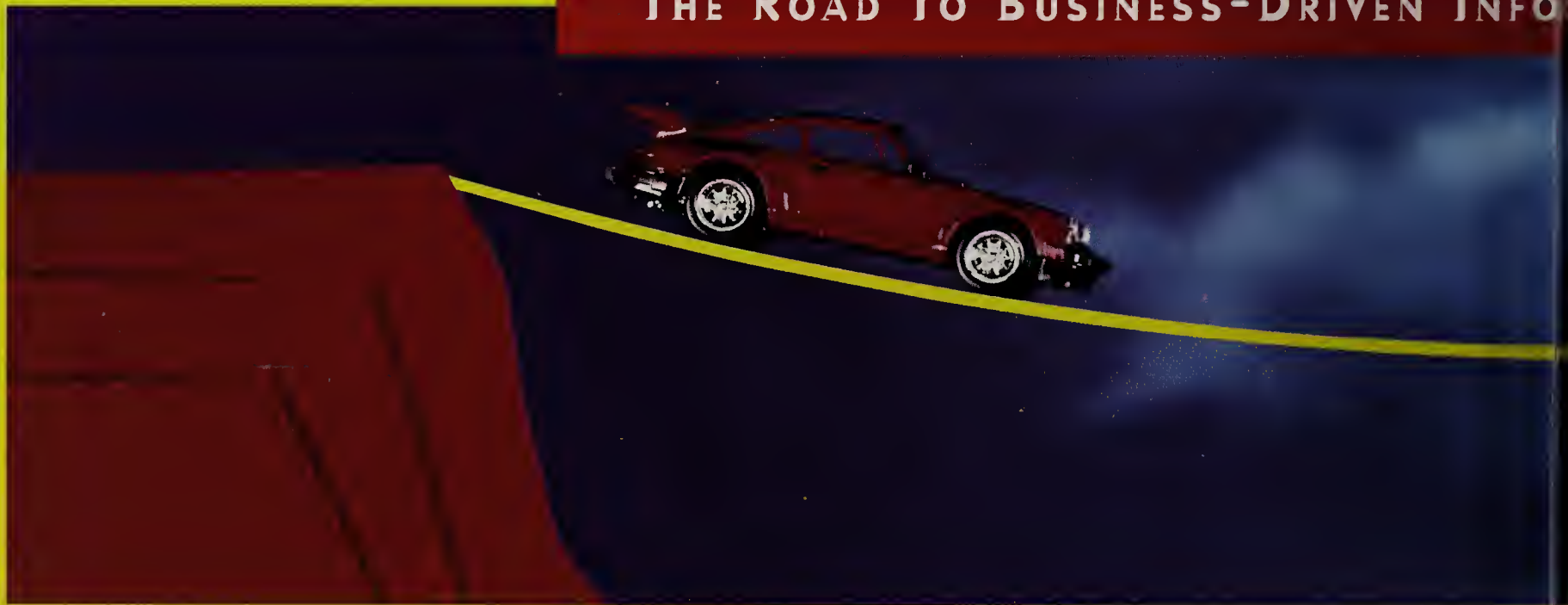
Through an agreement with Arlington, Va.-based SRA

International Inc., in 1996 the software was rewritten and upgraded for consumers, minus all the government jargon. Spreadsheet analyses of operational costs, current and expected project costs, and alternative cost analysis for IT projects, which often encompass hard-to-measure business process improvements, prompt business managers to ask questions they otherwise might not have considered. The BizCase process also develops implementation barriers and migration issues.

BizCase software runs on Windows 3.1 or Windows 95 and is available for \$895 from SRA International. A demonstration version of BizCase is available on the Web at www.sra.com. TurboBPR, is available free of charge at www.dtic.dla.mil/c3i/bprcd/ (there's a printable tutorial to help you get started). Click on "computer lab."

—E.B. Baatz

THE ROAD TO BUSINESS-DRIVEN INFO



CHOOSE A PARTNER WHO KNOWS THE WAY. The competitive edge delivered by today's advanced distributed technology is critical. But the costs can be outrageous – as much as ten times purchase price to maintain and service the average desktop. That's why IT executives are being

squeezed so hard to get control over spending and achieve business-driven solutions instead of just high-tech fashion shows. ¶ As a multi-billion dollar worldwide provider of technology management services, Inacom uses a tough, business-driven approach to managing distributed technology

brecht Battaglia. The study was dubbed the "Worldwide Benchmark Project" and was funded by Industry Canada, the Canadian equivalent of the U.S. Department of Commerce. Our findings clearly demonstrate the variability of software engineering performance at the corporate, regional and national levels in terms of productivity, quality and capability. We found that based on those criteria, the top-performing software-producing companies in the world are 200 times to 600 times more efficient than the bottom-tier producers. Software quality, as measured by the number of defects per line of computer code, varies by as much as 100 times to 1,000 times among the top and bottom producers.

We also discovered that although the huge disparities in software efficiency are growing rapidly, organizational knowledge about the software function remains sparse. For example, less than one in five companies studied have a complete application inventory. Less than one in

30 know the rate at which their software portfolios are changing. If those numbers aren't enough to keep you up at night, consider this: Less than one in 100 companies collect consistent quality information about their software projects.

Of course, the world's nations haven't done a very good job of keeping track of changing economic conditions either. But if one considers software engineering a core competence of the information age, then calculating statistics about national computing power and telecommunications lines per capita, for example, will be necessary in order for countries to maintain or advance their competitive position. Yet industrial-age measures of performance such as gross domestic product and industrial production continue to be the primary gauges of Wall Street and White House economists. Better predictors of a nation's growth and potential can be found by looking at a country's information processing capacity and capa-

bility. The country that measures those first will have a leg up in the global competition for jobs and wealth.

Likewise, for corporate CIOs, the race is on. In order to remain competitive, today's corporation must develop an understanding of the dynamics of global software economics. Doing so will require constant competitive calibration. That, in turn, will point to new forms and uses of benchmarking. Data and information will be collected in real-time.

New metrics, new methods and new competencies are clearly needed in the rapidly changing and increasingly global field of software development. Those CIOs who fail to understand international software metrics will fall victim to dynamics they do not understand. **CIO**

Howard A. Rubin chairs the computer science department at New York's Hunter College and is CEO of Rubin Systems Inc. He can be reached at 71031.377@compuserve.com.

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driven mindset to distributed technology. **¶** If you're absolutely positive your computer and communications systems are delivering every ounce of productivity you paid for, we salute you. If not, we should talk.

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Adapt or Die

To value IT properly requires viewing the enterprise as an evolving ecosystem

BY DALE KUTNICK and KAREN RUBENSTRUNK

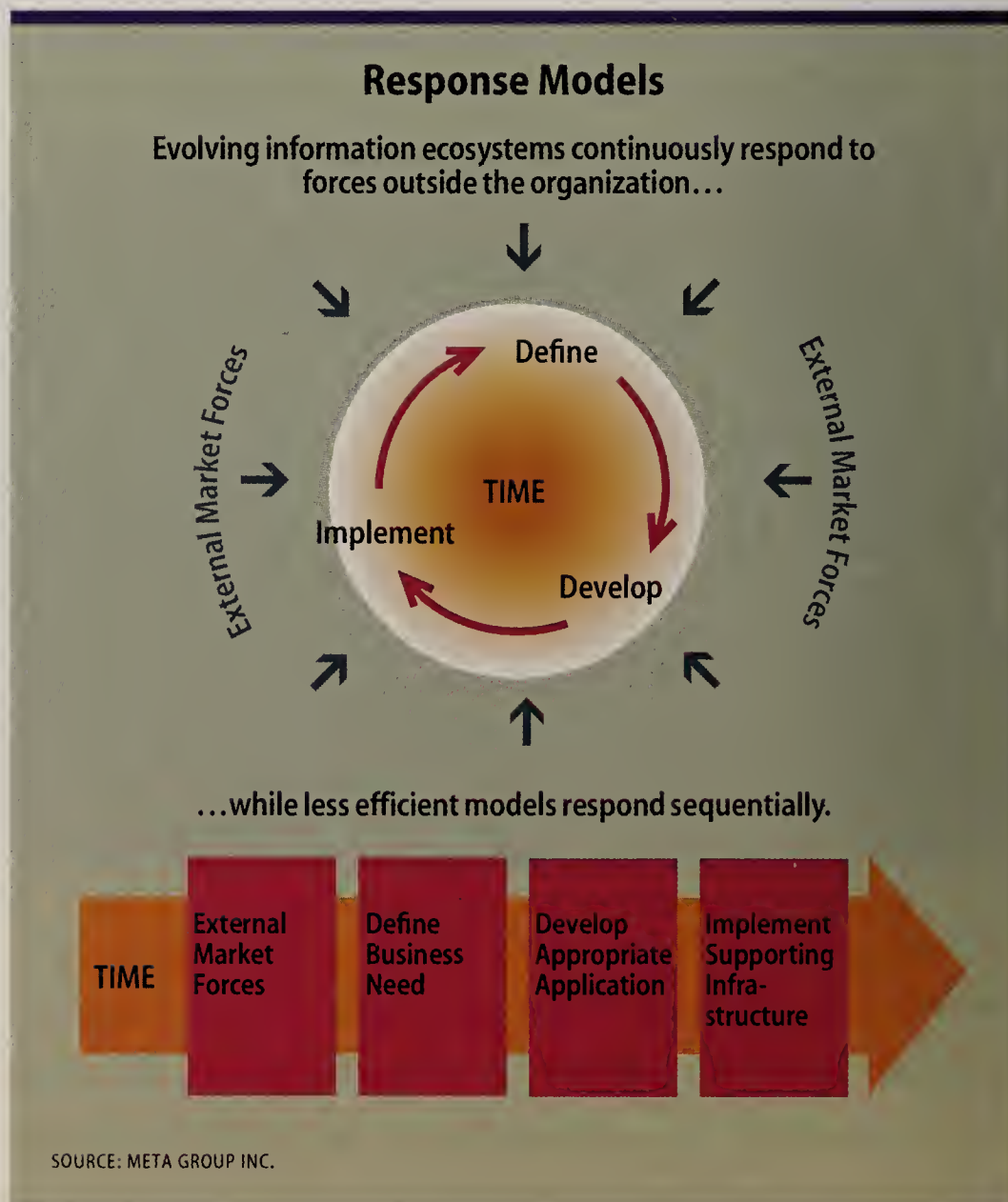
CIOs CAN'T ESCAPE management's insistence on establishing and measuring the business value of information technology. Despite elegant, academically sound metrics, most IT value equations fail because they attack the problem backward. To put it plainly, IT by itself has no inherent value. However, the information that IT makes available is priceless.

Proper understanding of and agreement on value are crucial to managing IT strategic planning. To help CIOs encourage their companies to measure the value of information rather than the value of IT, Meta Group Inc. has developed the "information ecosystem" model. The model, which expands on concepts presented by James F. Moore in *The Death of Competition* (Harper-Collins, 1996), rests on the premise that to exploit information technology fully, companies, business units and individuals must share information to catalyze business advantage and chart strategic direction. Like Moore's business ecosystem, the information ecosystem model is a biological metaphor that recognizes the codependency of everything in an ecosystem. Just as in our natural environment, where external and internal influences on an ecosystem force all living things in it to evolve, so influences on the information ecosystem change interactions among employees, customers and business partners—the members of an information ecosystem.

Paradoxically, the very same members of the ecosystem who require

information to successfully interact with the enterprise are simultaneously the sources of information within the ecosystem. Consider how an external force, such as the increasing rate of innovation, is forcing companies to adapt more rigorously to markets, the economy, regulations and competi-

tion. The next generation of electronic commerce will require companies to treat suppliers and competitors as partners and interact with them at a higher level. For example, they might share application-layer software to manage knowledge, logistics and inventories. Other external business forces such as "coopetition" and collaboration will increase the necessity of aligning business goals with IT. No business, and certainly no IS organization, can survive in the future by trying to maintain total independence. Once an enterprise is seen as an organic system in which every part strongly affects every other part, the walls between business departments seem to melt away.



Meta View

Living Architecture

The information architecture of an organization is the linchpin between the "I" and the "T." As part of an ecosystem, an information architecture must encompass information principles that cross lines of business. Such an architecture must also regulate the flow, timing, depth, breadth and ownership of information. Finally, it must demarcate levels of responsibilities among the corporation's customers, partners and employees for the maintenance of that information.

External pressures on an information ecosystem encourage the evolution of a "living" IT architecture that, like a complex organism, can adapt to an ever-changing environment. Rather than pursue architecture development by project, IS organizations must buy into the need to plan architectures designed to accommodate swift change. Old architecture development methodologies that had an IS shop that sequentially defined the business need, developed the appropriate application architecture and then implemented the supporting infrastructure will not work in today's business environment. Instead, IS must follow an adaptive architecture methodology that stipulates simultaneous defini-

Culture Club

Habits within an organization transcend all other behaviors, planned or unplanned

The ecosystem as a planning model will seem senseless without understanding larger corporate cultural forces. This is especially so for an organization's "information society," the map of how information is moved and owned within an enterprise. The four kinds of information societies are

- Monarchy, in which one person controls all information
- Anarchy, in which people control all the information they can personally garner
- Feudalism, in which a few powerful groups exercise control of information
- Federalism, in which shared information is managed centrally

A federalist information society is most effective because where sharing information is ordinary, information has a significant impact on the interactions among employees, customers and business partners.

—D. Kutnick and K. Rubenstrunk

Base your network on

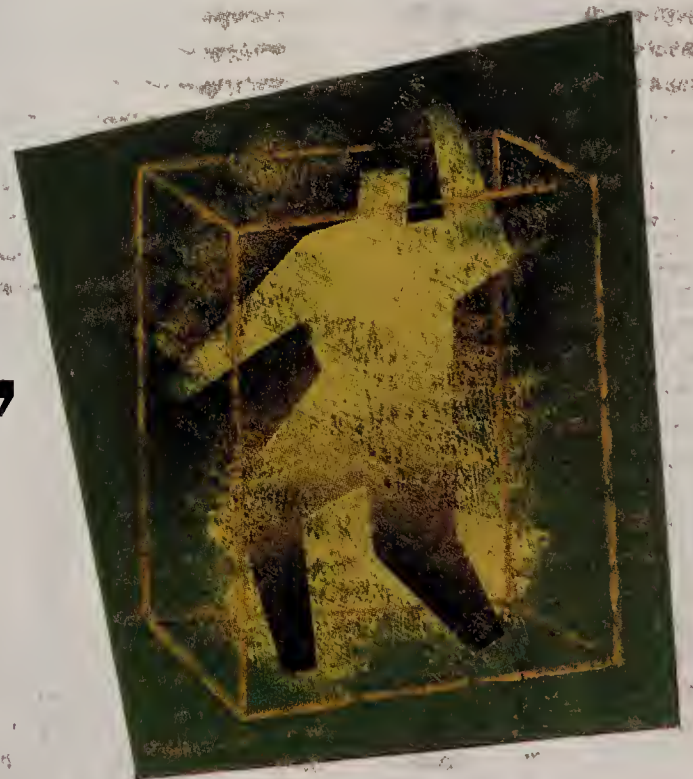
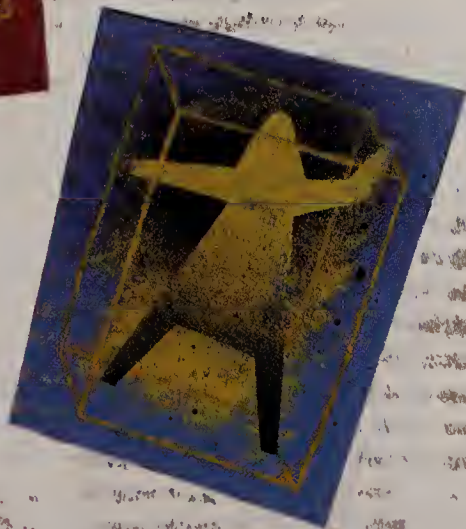
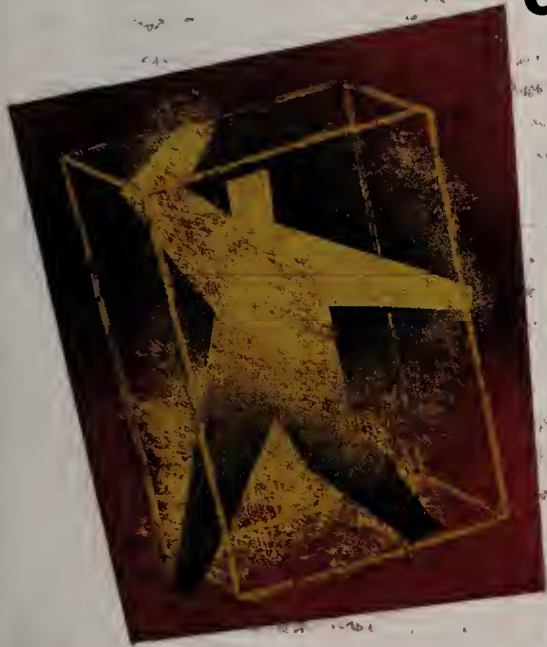
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Meta View

tion, development and implementation. Because of the need for swift flexibility, an adaptive architecture methodology actually increases standardization at the lower levels of infrastructure, such as communications and databases, and encourages increased responsiveness to changing business needs at the higher levels. Such an architecture will serve as a predictive tool for technology acquisitions that meet yet-to-be-developed standards and will encourage development of a common language used by business and IS for business plans and funding discussions. A common language enables the articulation of solid, value-added ROI links among information requirements, business goals and the technology necessary to achieve them.

Information and Value

At the heart of the information ecosystem is the recognition of the dependence on information as a driving force behind any decision. Information is a corporate

asset to be planned, budgeted, acquired, used and retired. However, the same senior IS executives who give lip service to "information as a corporate asset" are reluctant to completely endorse "information value." The irony of all this is that most attention-loving proponents of catchy phraseology insist we are in the midst of "the Information Age."

Although Meta Group believes that most IS and business executives do not consciously ignore the value of information, we also believe there have been no decent tools for determining its value in the strategic planning process. IS has failed in the past by trying to place a value on something most businesspeople don't understand—technology. Although the information ecosystem model is not presented as a panacea, we believe it helps project prioritization by placing the business value emphasis where it is easiest to understand—on the business information.

While organizations continue to encounter difficulty putting an absolute dol-

lar figure on a specific piece of information, they can easily rank information needs and make choices based on a hierarchy. For example, although trying to determine the worth of information is difficult, most organizations can decide if it is better to have access to information instantaneously for \$1 million or access to information that's 24 hours old for \$250,000. Executives will make that decision; IS's role is to highlight information needs and offer different information-based alternatives to business executives. Rather than suggest the solution, IS must present a variety of ways to provide the necessary business information, each with a separate price tag, and insist that business executives choose. **CIO**

Dale Kutnick, president, CEO and research director of Meta Group Inc., and Karen Rubenstrunk, vice president of the Meta Executive Council, can be reached at 800 945-META or www.metagroup.com.

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A NEW VALUE EQUATION

This year's Enterprise Value Award recipients possess the key elements to develop successful systems: good technology and processes, smart people and a rock-solid sense of the business

FOR FIVE YEARS NOW, CIO has honored companies that use information technology effectively to improve their operations and reach their business goals. During that time, we've expanded our definition of value beyond strict ROI calculations. The risk in doing so, of course, is that the definition can get too fuzzy, too subjective. It may be tempting to claim that a system has "improved customer satisfaction" or "decreased time to market" without producing data to back up those claims.

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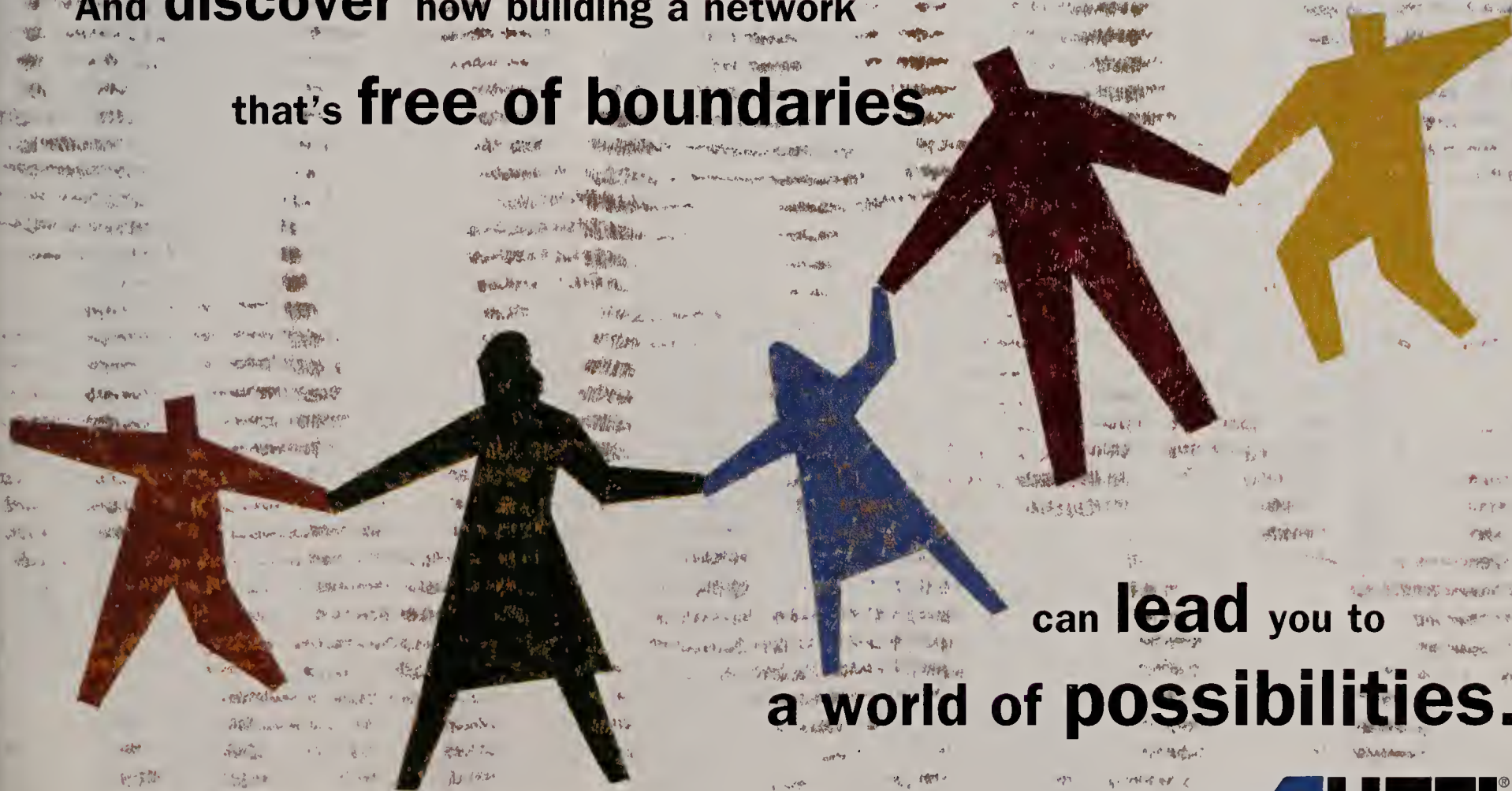
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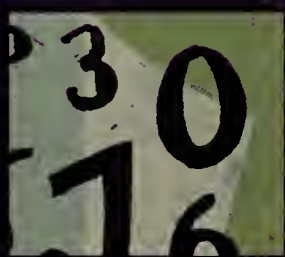
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THIS YEAR'S WINNERS



Bell Atlantic Corp.'s SaleService Negotiation System enables the company's consumer and small-business sales consultants to concentrate less on the sales and data entry processes and more on the customer. As a result, sales have increased, the company is more profitable and customers are better served.

Page 70



The Chase Manhattan Corp.'s Relationship Management System provides the bank's middle-market relationship managers and their supervisors with a consolidated view of all relevant customer information. RMS gives users greater access to current customer information and reduces the time required to gather that data from various legacy systems.

Page 84



Fidelity Investments' Maxxess delivers real-time market data to Fidelity's phone reps, independent brokers, automated voice response units and the Internet. Brokers are more productive, answering more calls and providing better information, and customer satisfaction has improved.

Page 62



MacGregor Medical Association's clinical information system gives doctors at the HMO's 28 ambulatory health centers instant online access to medical records for all of its 270,000 patients. Before implementing the system, MMA couldn't deliver paper records to the appropriate facility in time for 30 percent of patient visits.

Page 54



Schlumberger Ltd.'s intranet with satellite links makes unhindered global communications possible in even the most remote sites. It also provides the backbone for client/server IS projects that save money and create new revenue.

Page 78

But is value, like beauty, in the eye of the beholder? To some extent, maybe. But for the most part, no. The companies we honor in this issue have proven the value they've created with their winning systems. They set out with clear, specific goals, and they tracked their progress along the way. Value is the result of a process; it's not something you think about after the fact.

Business value is not created in a vacuum. This year's Enterprise Value Award winners were guided by the critical success factors in their industries and markets. Neither is value created in isolation within the IS department. Systems worth celebrating are the fruit of true partnership and collaboration between business and IS executives.

We hope you find this issue of *CIO* interesting as well as enlightening. Please join us in congratulating this year's honorees—and join the winners, *CIO* editors and this year's process team in a discussion of enterprise value in our online forum, running Feb. 10-21 at www.cio.com/forums/EVA.html.

THE JUDGES

The judges chose the winners based on the criteria, filtered by their own perceptions and experiences. Nominees were presented, discussed and given an initial vote of yes, no or maybe through a secret ballot. We held a second (and in some cases a third) round of discussion for companies that received inconclusive votes. While we pushed for consensus, majority ruled.

JOHN CROSS

Head of IT, BP Group
The British Petroleum Co. PLC

JOHN THOMAS FLYNN

CIO
State of California, Department of Information Technology

JOHN GLASER

CIO and Vice President
Partners HealthCare System Inc.

ABBIE LUNDBERG

Editor
CIO

PATRICIA M. WALLINGTON

CIO and Vice President
Xerox Corp.



THE PROCESS TEAM

The process team validated data, organized results and presented its findings to the judges. The team's objective was to make sure all the data had been investigated thoroughly and summarized appropriately.

MARY SILVA DOCTOR

Managing Partner
Omega Point Consulting

JOHN C. HENDERSON

Professor of MIS and Director of Systems
Research Center
Boston University

VIRGINIA RECK

Senior Partner
Kendall Consulting Group

RICK SWANBORG

Managing Director
Tradewinds Associates

MADELINE WEISS

President
Weiss Associates Inc.

Methodology

Applications were gathered between February and July 1996. CIO editors examined the nominated systems' value to their organizations, the degree to which they were internally conceptualized and driven, and their ability to deliver a measurable financial return.

We passed on the nine entrants that qualified for further consideration to a process team of independent consultants and academics (see "The Process Team," this page). In August and September, the team conducted on-site meetings with the applicants and others involved in developing, implementing and using the systems; obtained detailed information on the systems' costs and returns; and observed the systems in action to determine their impact on the business.

After concluding the site visits, the process team delivered detailed reports, along with notes and the original application forms, to a distinguished panel of judges (see "The Judges," Page 42) at a day-long meeting in Boston. The judges evaluated the material and discussed it with each other and the process team. There was no minimum or maximum limit on the number of possible winners. By

the end of the day, the judges agreed that five of the companies deserved an award.

Deciding Factors

The judges based their decisions on four major criteria. The most important was the extent to which the system adds business value in furthering the organization's strategic or operational objectives. The second factor, return on investment, was used mainly as a qualifier: The measurable financial return the system provides to the organization was considered in making the first cut, but relative ROI among the finalists was not a big factor in selecting the winners. The judges also

Business value is not created in a vacuum. This year's Enterprise Value Award winners were guided by the critical success factors in their industries and markets.

looked at the importance of technology to achieve results—whether the business need could have been satisfied without the system and how much of the overall process is touched by the technology. Finally, applicants were judged on the quality of collaboration between the business unit and IS organization during all phases of the project. **CIO**

HONORABLE MENTIONS

**AMERICAN RED CROSS,
METROPOLITAN ATLANTA CHAPTER**

Non-Profit Business Integrated
Management System

**THE DUPONT MERCK
PHARMACEUTICAL CO.**

Integrated Business Enterprise System

**LAHEY HITCHCOCK CLINIC/MARY
HITCHCOCK MEMORIAL HOSPITAL**
Macintosh Clinical Information System**MOBIL OIL CORP.**

Process Management Information
System

PRIDE OF FLORIDA

Computer Integrated Manufacturing
System

Microsoft Exchange Server 5.0

**takes the Internet
and gives it a good
in the messaging**



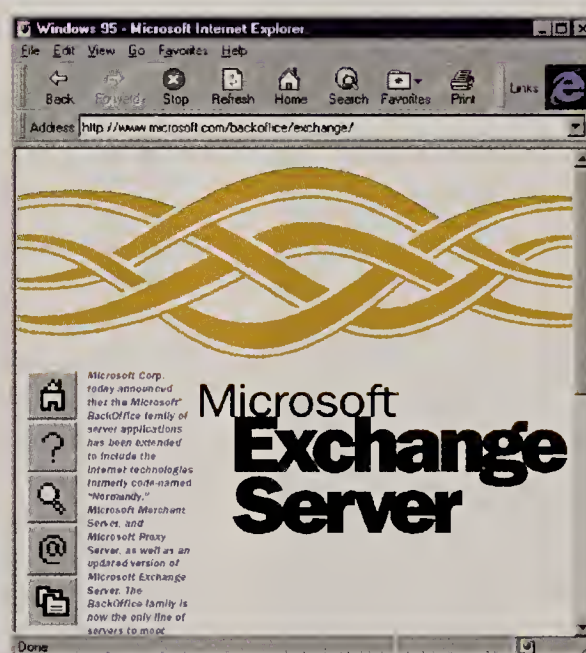
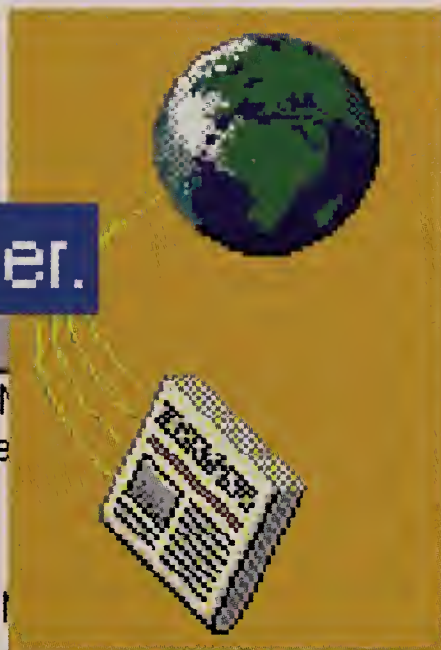
swift kick and collaboration tools.

Container  Encryption

in Site TRGI - Recipients]
ame of your POP3 server.

Subject

☐	Short-term strategy—first draft	BobM
☐	Why Bob is wrong	Mike
☐	Re: Why Bob is wrong	KateT
☐	Re: Why Bob is wrong	ElkeD
☐	Second draft strategy	BobM

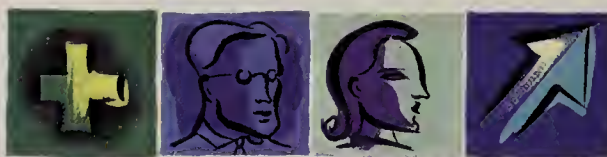


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popular Internet protocols and standards, so you can extend all this goodness to the Internet. Now ordinary individuals can set up discussion groups. Far-flung teams can begin collaborating. Users can access their mail from any standard e-mail client anywhere—even from a Web browser. In short, Microsoft Exchange, proud member of the Microsoft BackOffice™ family, gives you a comprehensive messaging and collaboration system that knows how to make the Internet perform. And that, my friends, is the best of both worlds.

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ROUNDTABLE

VALUE JUDGMENTS

A panel of IS cognoscenti discusses the changing relationship of IT systems and the businesses they support

BY CHRISTOPHER KOCH

USING SIMPLE NUMERIC TERMS TO DEFINE VALUE CAN BE DANGEROUS, because there is a human element that can be neither calculated nor underestimated. In business, value emerges when people feel more competent, more fully able to use their time, talents and judgment in ways that seem—to them, not just the boss—more useful and fulfilling. Cost savings and new revenues are the effects, not the causes, of those passionate stirrings within people. CIOs need to find ways to identify and support the intangibles that create value if they hope to reap the bottom-line effects—the cashola—on a continuing basis. The judges charged with evaluating this year's Enterprise Value Awards finalists understand what's behind the hard cost savings, and they've seen what inspires people to excel.

Some of our judges (see "The Judges," Page 42, for a complete list) agreed to discuss with us their particular methods for capturing the elusive concept of business value. Patricia M. Wallington, vice president and CIO of Xerox Corp., and John Cross, head of IT in the BP Group of The British Petroleum Co. PLC, were joined by Albert Aiello, CIO of Fidelity Investments and president of Fidelity Investments Systems Co., who gracefully bowed out of the judging process after his company became one of the finalists, and Rick Swanborg, managing director of Tradewinds Associates, who directed the due-diligence review of the nominations as well as the final judging process.

With the trend toward IT becoming more pervasive in the organization, do you feel that it is more difficult to find and prove specific value today?

Wallington: IT is far more integrated with the business, which means that [its value can't be assessed separately from the value of the] business opportunity of which it is just one part. When you get that level of integration, you're not looking at IT in isolation.

How about IT projects that don't have an immediate tie to business value, such as infrastructure projects? Is it difficult to prove value there?

Swanborg: Value used to be considered application by application, and now it gets into some of the softer sides of the enablement of technology, like e-mail, videoconferencing, exchanging documents. If your organization is global and you want people to communicate more easily, then the valuation of infrastructure becomes greater. But if the business is still of the mind-set that says, "We're going to do this an application at a time," they don't care about anybody communicating, and infrastructure becomes an ugly cost to them.

Wallington: Infrastructures are justified or valued more as part of overall strategies than as part of a particular project. And so you look



Roundtable participants discuss how they prove value in their IS organizations.

at what you *can't* do in the business if you don't make that kind of order-of-magnitude change.

Cross: One of the most interesting new issues for IT is the extent to which the infrastructure has become a major change agent for the reconstruction of organizations. When BP's new chairman arrived, he asked, "What's the nature of an infrastructure that would bind the corporation together [globally] for the future, that would couple behavior and development to organizational structures?" That led to a major effort to turn us into a much more explicit, network-centric model of processing and [led] also to some extreme standardization across the desktops to achieve that interoperability.

The board had this long debate about it, and one of the more traditional managing directors asked, "Now, what's the cost of all this?"

The chairman simply cut across all that. "There's no point worrying about that, gentlemen," he said, "because it's clear to me that we can't proceed with what we want to do without this." So infrastructure becomes sort of a *sine qua non*—without it, you will have nothing.

And, secondly, he said, "I will automatically reckon [the new infrastructure] is worth three percentage points on my net income." So he took a punt on the perceived value on what that organizational structure would be worth to the group's income. And that's a strategic decision.

That's a very profoundly different dialogue and debate. It's not an application-specific one. The debate about the infrastructure is not a local business unit subject for debate anymore. The issue becomes, now that you've built the information "road" for the organization, what trucks are you going to put on it? That's the next challenge.

Swanborg: Companies that don't have a strategic initiative generally have what they call "stealth infrastructure"—they do it by project. They try to incrementally get there, which, as often as not, is very tough.

Wallington: What's interesting to me is your comment, John [Cross], that infrastructure can be and is discussed at the board level and certainly at the senior executive level today. I don't think we saw that five or six years ago.

How have you used infrastructure to point the company in a particular strategic direction?

Cross: We developed a colloquium for the top 30 executives, which included the board, to really look at the emerging technologies in the next two to five years. [We wanted to investigate] the extent to which those technologies are going to radically change the way people work together and impact the value chain from supplier to customer. Will disintermediations occur? If so, where will those be?

Another question was, "To what extent are

"We're not VPs of information technology. We focus on the transformational uses of the technology and see the intersections of technology and business opportunities."

—Patricia Wallington



ROUNDTABLE

"Value used to be considered application by application, and now it gets into some of the softer sides of the enablement of technology, like e-mail, videoconferencing, exchanging documents."

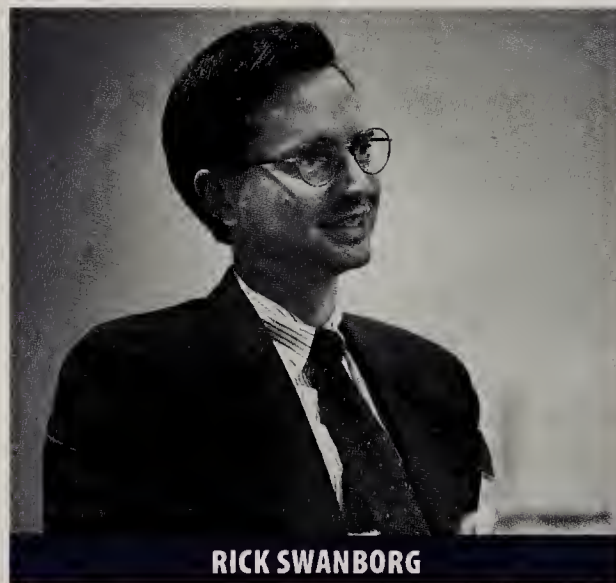
—Rick Swanborg

those technologies going to enable knowledge management in more profound and powerful ways? From all that came a strategy paper for the board, and that was where the justification-of-infrastructure debate came from.

What processes or strategies have you used to clarify the value of IS to business executives? What's an effective communication strategy?

Aiello: I don't know if there are magic words that will make the doors open. If you have a track record of credibility, the next time you go in there, they'll remember that you were right the last time you came in.

Wallington: But we're moving into an environment where there's less suspicion and mistrust of the value of IT. There's much more pull from the business to create and give more value. You do still have the occasional executive who is not comfortable with IT and is not as steeped in the knowledge of the impact it can have on his business. You need to recognize where people are coming from and tailor your communication in such a way that it's at the right level; and you may have to expect that you have a longer selling process, perhaps, with some people because they need to internalize it in much smaller steps.



RICK SWANBORG

Beyond simply selling the value of a given project or business initiative, how can you influence the CEO's thoughts about value from IT?

Wallington: Well, I'm in the happy circumstance of having a CEO who always asks the right questions on a regular basis. The first is, "Do I have a world-class infrastructure? If not, what does a world-class infrastructure look like today?"



PATRICIA WALLINGTON

The second question is, "What's possible as a result of the technology?"

That kind of dialogue brings the best of the knowledge from both perspectives to the table. To me, that is absolutely the consummate role of the CIO. That's why we're not VPs of information technology. We focus on the transformational uses of the technology and see the intersections of technology and business opportunities.

If you're talking to the presidents of the divisions, you can bring that down a level and talk about continuous improvement, ways to be more efficient, ways to manage the resource differently, but the CEO is worried about the future.

If it's true that CEOs are becoming more enlightened, does that mean you are asked to quantify value in ways other than, "Is it going to let us enter this new market?" or "Is it going to enable us to collaborate around the globe?"

Cross: Recently, we examined some technologies that we thought had the potential to achieve something. The CEO's expectation was that should it prove valuable, the business line managers would see it and would be happy to pay for the next stages.

So really he was buying an "option" on the technology to see if there was value. If it proved itself, he expected there would be business pull for its [subsequent application in other activities].

Aiello: We have a dedicated [advanced technology] group that culls information on new technologies because there are literally hundreds of them out there right now. We couple that with an approach that says we invest for the long term and don't have to necessarily recover the money quickly—and, by the

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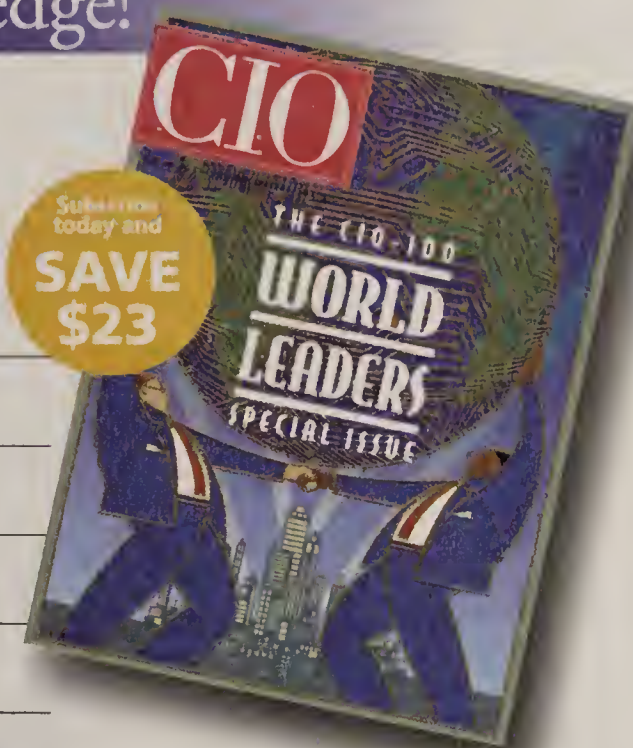
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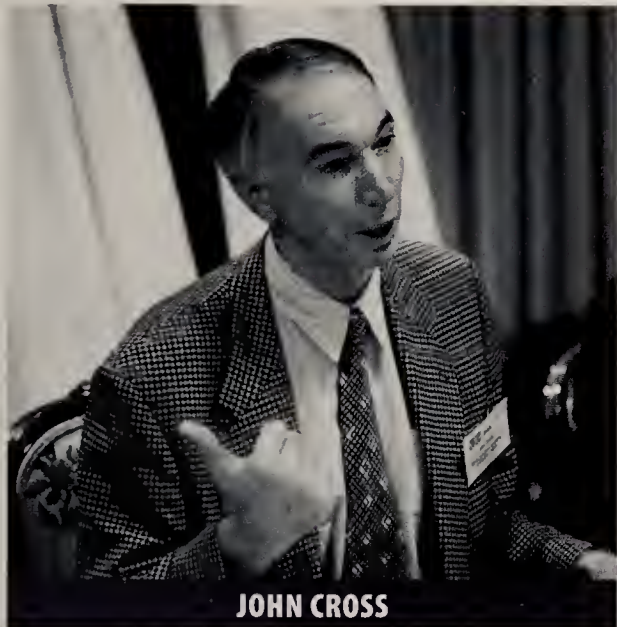
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way, any prototypes must ultimately gain the support of line management. And over three or four years, I want to see how they've all worked out. The process is sort of like R&D



JOHN CROSS

at a pharmaceutical company. They invest a lot of money in various drugs, some of which ultimately go to market and make a lot of money and some of which don't. That's a model for technology in this day and age. It's not an immediate cost justification of something. It's actually an R&D approach.

In terms of measuring value within the IS department itself, traditionally the focus has been on things like application development and cycle time. How do you move beyond an inside focus to an outside focus that measures the value of your own people and processes in terms of their contribution to the business?

Aiello: How about surveying the business? We survey a thousand internal customers every quarter on all the products and services we deliver, and those survey measures are used for corrective action on each of the products and services, from e-mail to computing capability to telecommunications.

We send the surveys out electronically and usually get about a 60 percent response rate. And we take a [perception] survey once a year of our 28 most-senior business people.

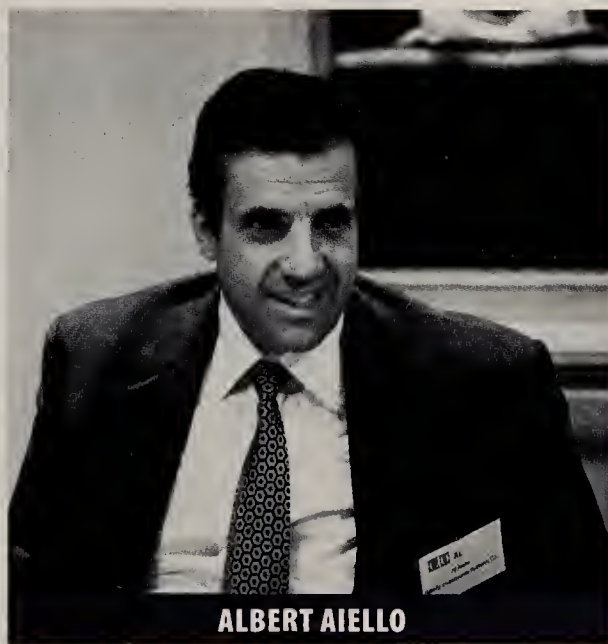
One of the questions is, "How satisfied are you with the perception your industry has of our technology?" Or, "Do you feel like your systems development process is cost-effective?" Once you get that perception back, you target those senior managers and try to address their perceptual issues. As you all know, this is not a busi-

ness of merely managing nuts and bolts. It's also a business of managing expectations and perceptions.

Wallington: We also do some event surveys, so three months after the launch [of a big project], we'll put out a customer survey on a global basis. We come up with one number for customer satisfaction. We track it over the years. We actually do that as part of our EDS service-level measurement [Xerox has an outsourcing relationship with EDS Corp.].

We use our quality tools to go in and understand what the top dissatisfiers are in each local unit, and then we look for the systemic issues that may have to be dealt with from a corporate perspective.

Cross: We borrowed the old Nolan, Norton Balanced Business Scorecard model to track a number of components. One is the efficiency of the service's unit costs, and we do external benchmarks for that. We track [and examine] good practices shared. And the third component is the customer, both at the operating



ALBERT AIELLO

level and the perception level. That's outsourced, so it sits as an important piece of qualitative feedback because we pay depending on the quality of the service.

Aiello: We also [measure] employee satisfaction. They like responding if they think there's someone listening on the other end. When we get the results, we go back to workgroups and discuss them. The theory these days is that to get satisfied customers, you need satisfied [IS] employees. **CIO**

Senior Writer Christopher Koch can be reached at ckoch@cio.com.

"We survey a thousand internal customers every quarter on all the products and services we deliver, and those survey measures are used for corrective action on each of the products and services."

—Albert Aiello

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WINNER PROFILE: MACGREGOR MEDICAL

A CURE FOR BROKEN RECORDS

This HMO discovered that taking good care of patients
can also be good for the bottom line

BY ALICE DRAGON

EVERY YEAR, Houston's MacGregor Medical Association (MMA) provides health care to some 3,000 pregnant women who dutifully leave urine samples in plastic cups and proffer their arms for blood tests at each checkup. When one patient's urine test result showed evidence of small amounts of protein in early 1996, her doctor wasn't overly concerned; such samples are frequently contaminated. But as Dr. Martin Pernoll, MMA's chairman of obstetrics and gynecology, reviewed the weekly test results of pregnant women, hers worried him enough to recommend a full workup. The patient, it

turned out, had lupus, a chronic disease that affects the immune system, but didn't know it. Because her condition was diagnosed early, she was put on a treatment plan that prevented complications that often accompany the disease: kidney problems, hypertension, preterm deliveries and miscarriages. She gave birth to a healthy baby and now sees a specialist to control her lupus.

What allowed Pernoll to flag the woman's chart and recommend further tests was a state-of-the-art electronic patient system that lets him spend just an hour each week reviewing all of the nearly 2,700 current obstetric charts for



Laura Cook, chief quality officer, and Jim Sloane, director of IT, partnered to build a patient records system that even computer-phobic doctors love.

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abnormal lab results, worrisome conditions or family histories, and unusual treatment methods, all referred to as "outliers." The system not only enables MMA to serve a growing number of patients but also helps the HMO go beyond caring for patients one-on-one to treat them as a population as well. "So many problems are not sins of commission, but are simply due to the fact that information was overlooked or not available," says Pernoll. "A system like this minimizes the chance of that occurring."

MMA patients haven't always had the luxury of an extra set of eyes gazing at their charts. In fact, in the late 1980s, doctors didn't

plenty of options for keeping tabs on bills. "Computer systems in hospitals are all financially driven," says Birge. Such systems track only "the diagnosis, sending the bill and whether the hospital got money for the bill it sent. They have nothing to do with the practice of medicine." What's more, hospital care tends to be episodic, says Martin, and it's the long-term patient-doctor relationship that really counts. Because its patients can see any doctor at any facility, MMA had no choice but to build its own system.

First released to physicians in October 1991 as a character-based Cobol inquiry system, MMA's Clinical Information System (CIS) has evolved into an intuitive, GUI-based client/server application that doctors can access through PCs located in their offices, outside exam rooms, at nurses' stations or at MMA-affiliated hospitals' emergency rooms and labor and delivery rooms. Some physicians also have access to the system from home over the Internet or via a dial-up modem.

Caregivers can pull up records by typing in a patient's name, medical record number or social security number or by clicking on the patient's name on a screen that shows doctors' daily appointment schedules. At the top of each record are two standard boxes outlining the patient's significant problems and any drug allergies. Below those, a transcription tab pulls up headlines for all progress notes from each patient visit, regardless of doctor or facility. Users click on the headlines, which appear in reverse chronological order, to read the full text, and they can conduct keyword searches on one or more notes. The screen also has tabs providing quick access to all lab results (critical information appears in red) as well as the patient's immunization history and demographic information. An expanded version of CIS allows Pernoll and his OB/GYN staff to track 37 different health factors throughout a pregnancy; when a woman shows up at the hospital in labor, the attending physician knows as much about her pregnancy as her own doctor does.

Sloane, Chief Quality Officer Laura B. Cook and Manager of Applications Development Gina Hightower worked closely with clinical practitioners to develop a system that would meet physicians' needs, and they still welcome input from caregivers through a feedback button built into the application—but they didn't force doctors to use the system at first. Those

DEFINING VALUE

MacGregor Medical Association's Clinical Information System gives doctors at the HMO's 28 ambulatory health centers instant online access to medical records for all of its 270,000 patients. The system has more than paid for itself by enabling reductions in medical records staff, shorter hospital stays, fewer preterm births, less neonatal intensive care treatment, less duplication of lab tests and X-rays, and fewer lawsuits.

have access to patient records during 30 percent of patient visits. Houston's largest group-model HMO, MMA specializes in outpatient medicine. At that time, it had 11 health centers and relied on an extensive courier system to transfer records needed for the next day's appointments from a central filing location to the appropriate facilities. But for patients needing immediate attention, there was a 55 percent chance that their records would not arrive in time if they booked a same-day appointment. Not only was valuable appointment time wasted reconstructing the patient's medical history, but unreliable patient memories—and the fact that patients don't always understand the relevance of key facts doctors need—meant that physicians had to practice medicine with incomplete information at their disposal. And without access to patients' test results, doctors often ordered duplicate tests, which cost the HMO money and put patients through unnecessary turmoil.

CIO Keith Martin and CEO and Medical Director Dr. James R. Birge believed an electronic patient records system could solve those problems and envisioned building an integrated clinical, scheduling and billing system. When Martin and Jim Sloane, director of IT, set out to tackle the patient record issue, they couldn't find a single electronic patient record system on the market that addressed the needs of group-based practices, though they found

"It's hard to
measure ROI in
the health-care
industry, but I'd say
their numbers are
impressive, and it's
inherently *good* to
have information
available to doctors."

—JOHN GLASER

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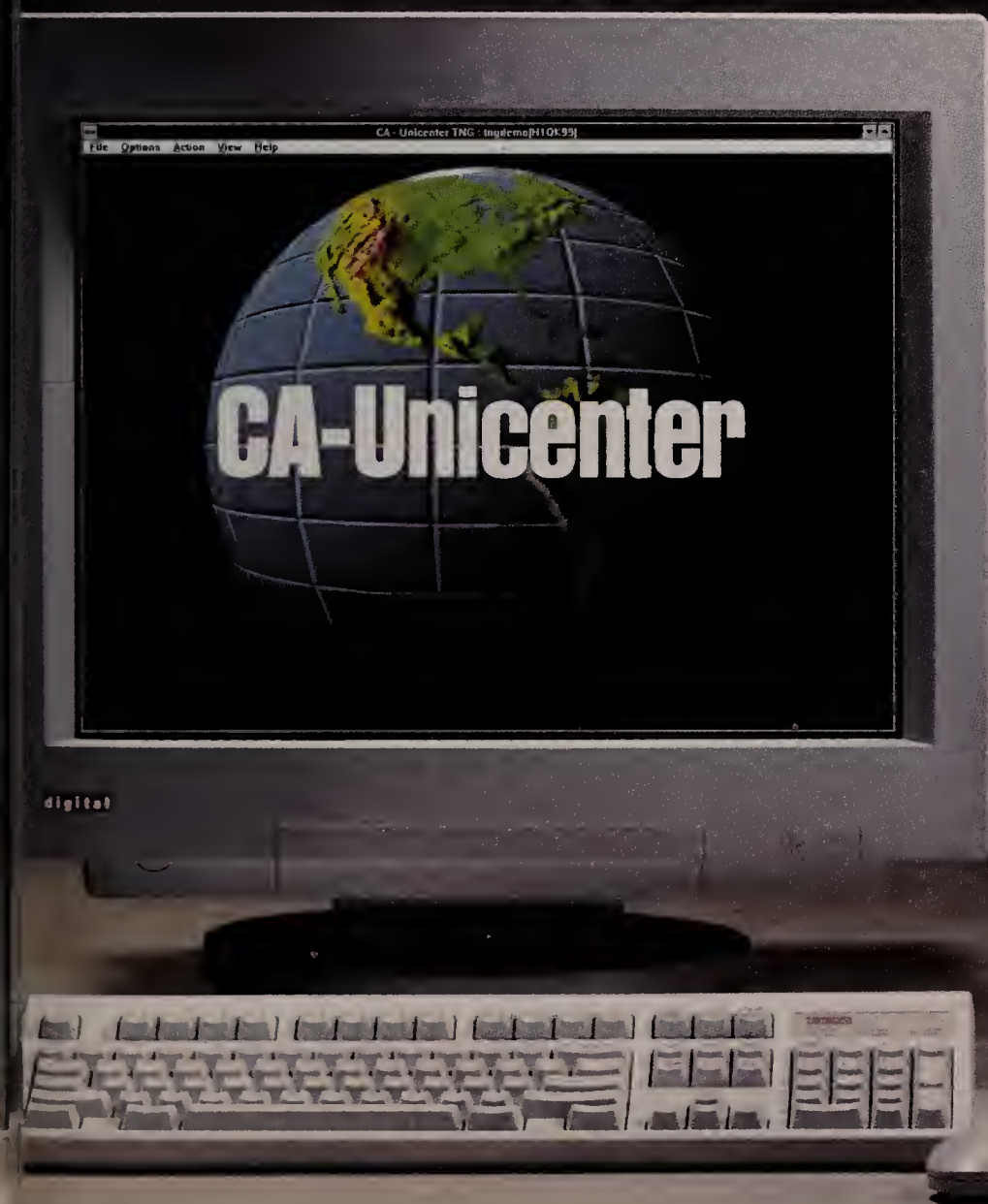
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WINNER PROFILE: MACGREGOR MEDICAL

Perhaps the most
important benefit
of the system is that
it makes proactive
care possible.

who tried it quickly became advocates for the system; one of MMA's founding physicians went from being "allergic" to computers a few years ago to clamoring for more memory, says Pernoll. Adds Birge, "The process to move paper records was so abysmal that when this showed up the doctors fell all over themselves—even the computer-phobic people—because they were so exasperated with the non-system that was present before." CIS makes a big difference to patients as well, says Dr. Peter J. Schwarz, a gastroenterologist and chairman of MMA's Health Information Management Committee. "They know that you know more about them and that you're not making decisions based on assumptions," he explains.

Doctors bought into the system because it

satisfies a real need for information and doesn't—yet—require them to key in any data. Although OB/GYN doctors or their assistants do type some information into the perinatal system, most physicians merely dictate progress notes into a phone-based recording system. Today, those notes are transcribed and entered into CIS within 48 hours; once speech-to-text technology matures, Sloane hopes to eliminate the need for transcription. Information about procedures, immunizations, drug allergies and diagnoses from the "encounter forms" doctors fill out for billing purposes also winds up in CIS, as does demographic information collected when new patients book appointments. The system provides access to all records dating from 1991, and plans call for scanning in records from other institutions by 1998.

Birge and Martin had little difficulty convincing MMA's board of the business value of providing caregivers with immediate access to patient records when they asked for funding in 1990. Although IS did not establish specific metrics for measuring ROI at the outset, the \$8 million system has more than paid for itself in hard and soft returns that resulted from reductions in medical records staff, shorter hospital stays, fewer preterm births, less neonatal intensive care treatment, less duplication of lab tests and X-rays, and fewer lawsuits.

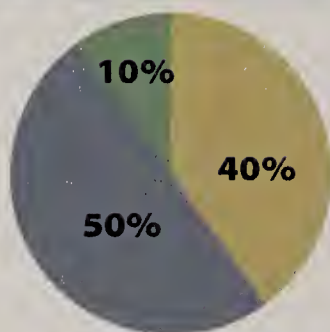
"It's hard to measure ROI in the health-care industry, but I'd say their numbers are impressive, and it's inherently good to have information available to doctors," says Enterprise Value Award judge (and former winner) John Glaser, CIO and vice president of Partners HealthCare System Inc. in Boston.

THE NUMBERS: MACGREGOR MEDICAL 1991-95

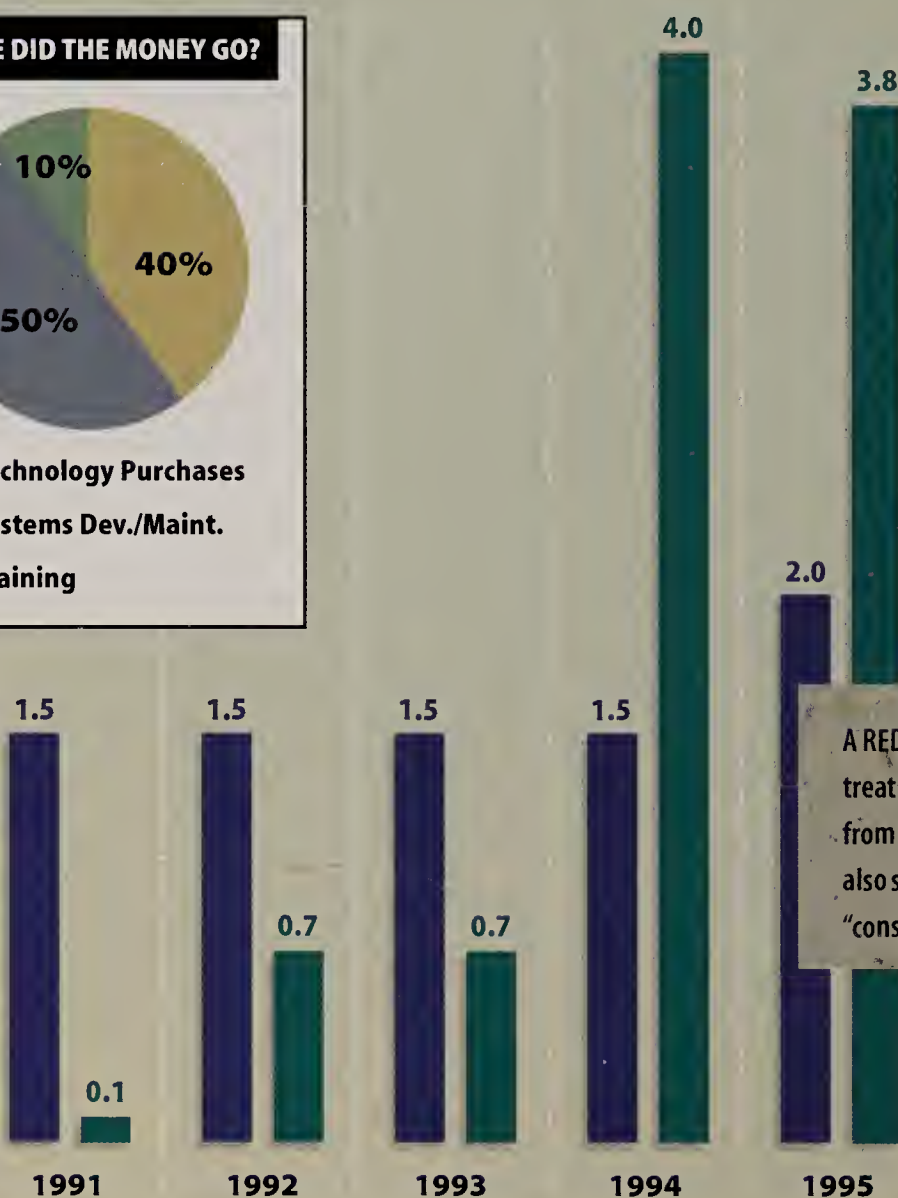
■ Total Investment (\$M)

■ Total Return (\$M)

WHERE DID THE MONEY GO?



■ Technology Purchases
■ Systems Dev./Maint.
■ Training



A REDUCTION IN PRETERM BIRTHS and neonatal intensive care treatment accounted for the largest savings. Indirect savings from a reduction in lawsuits and improved patient health were also significant. MMA executives view the ROI numbers as "conservative."

"What's noteworthy is the intelligence of the implementation—the organizational and clinical commitment to doing it and doing it well. In health care, people are unsure of ROI and hence fail to commit. These folks committed."

Although trickier to pin down, the positive impact on the quality of care is likely more significant than bottom-line ROI. Cook says CIS not only helps her track quality more accurately but also has simplified her job of convincing doctors to focus on quality improvement. Before CIS went online, Cook,

THE BOTTOM LINE

Total Gross Investment: \$8M | Total Gross Return: \$9.3M

Net ROI = 16.3%

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WINNER PROFILE: MACGREGOR MEDICAL

ANATOMY OF THE SYSTEM

Hardware: 486 and Pentium workstation clients running Microsoft's Windows 3.1; Windows for Workgroups or Windows 95 link to a Tandem Computers Inc. RISC-based, fault-tolerant, eight-processor Himalaya server. The Clinical Information System (CIS) relies on Tandem's Structured Query Language/Massively Parallel (SQL/MP) database, which contains 60GB of data, including 1.3 million patient records, 3.5 million progress notes, 26 million lab results and 9,400 perinatal records. Typical response time is one to two seconds.

Software: Client code for CIS was developed using Visual Basic 3.0 Professional Edition; CIS server code was written in Cobol85 with embedded SQL commands using Easypath code generator from Fourth Dimension Software of San Mateo, Calif.; Tandem's Remote Server Call (RSC) software is the middleware.

Architecture: The network uses TCP/IP over a 10Base-T Ethernet with Cisco routers and Synoptics hubs. At each of MMA's 29 remote sites, Microsoft NT servers running Microsoft's Systems Management Software distribute client software.

a registered nurse, had to cull through a sampling of charts by hand to find statistics on quality of care. She estimates that her studies had a 20 percent margin of error and says many doctors took that as license to ignore her data—and the notion that there was room for improvement. “In the early '90s, I was the most hated woman in the organization,” she jokes. Today, no one questions the validity of her reports, which are generated from data on the entire patient population, and doctors seek her out to ask how their departments are faring. “They want to know that they're not an outlier, that they're practicing within the norm,” says Cook. What's more, because she can create real-time reports on open cases as well as retroactive outcomes reports, problems can be spotted and acted upon sooner.

nant patients; in 1995, that number jumped to 90 percent, which MMA says helped reduce preterm births from 8.7 percent in 1994 to 5.1 percent in 1995. Reducing the preterm birth rate doesn't just make for healthier babies; it also saves the \$2,000 to \$5,000 a day it costs to keep a baby in intensive care. The incidence at MMA of toxemia, a dangerous condition in which a pregnant woman develops swelling, protein in the urine and hypertension and sometimes has seizures, is now one-third the national average. Pernoll says he's never been able to decrease it any other way.

Sloane and Hightower are in the process of rolling out a new version of the system that will let physicians order lab tests and X-rays; a prescription component will automatically

“We think it brings value to the quality of care provided, and employers should be willing to pay a little bit more money for this extra service.”

—JAMES BIRGE

Indeed, perhaps the most important benefit of the system is that it makes proactive care possible. Because CIS is tied to the scheduling system, for example, Cook can compile a list of patients due for shots who haven't scheduled appointments and remind doctors to follow up with them. She credits the system with helping increase the immunization rate among patients under the age of 2 from 39 percent in 1992 to 76 percent in 1996. Cook also tracks down diabetes and glaucoma patients who haven't had eye exams and women who haven't had mammograms in the last 12 months. When the Food and Drug Administration recalled the drug Omniflox in 1992 because it was causing deaths, Cook worked with IS to run a report in four hours that identified three patients—out of the 348,000 patient progress notes then in the MMA system—for whom the drug had been prescribed. The patients' doctors notified them that day and advised them to stop taking the drug, prescribing substitutes as needed. Department heads also use the system to monitor new doctors (Are they ordering unnecessary procedures? Do their treatments seem appropriate?) so that they can offer timely feedback as mentors.

The results of preventive care supported by the specialized OB/GYN system speak for themselves: In 1992, MMA offered prenatal care in the first trimester to 70 percent of preg-

check for dangerous drug interactions. Pernoll is advocating adding icons to the patient record screens to provide quick access to information about the patient's birth, growth and development, and any surgical procedures, and Birge envisions incorporating artificial intelligence into the system so that it will send out red alerts when it spots cases that need more scrutiny.

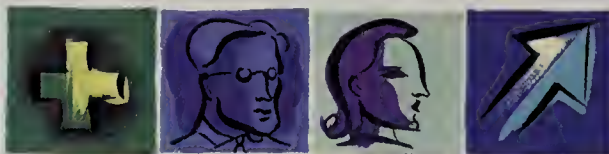
In the meantime, Birge believes the system, which allows MMA to handle 900,000 visits a year from 270,000 patients at the HMO's 28 outpatient health centers in Houston and San Antonio, sets MMA apart from competitors. “We are touting it as a differentiator in our marketplace,” he says. “We think it brings value to the quality of care provided, and employers should be willing to pay a little bit more money for this extra service.” The system itself, which is used by HMOs in St. Louis and Austin, Texas, for a fee that covers costs, also represents a potential source of income for MMA.

But the bottom line for MMA doctors is that CIS has become as indispensable as their stethoscopes. “You can say that having everything immediately available is a convenience,” concludes Pernoll. “But it isn't. It's a necessity if you're going to do the best job possible.” **CIO**

Associate Editor Alice Dragoon can be reached at adragoon@cio.com.

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WINNER PROFILE: FIDELITY INVESTMENTS

SEMPER FIDELITY

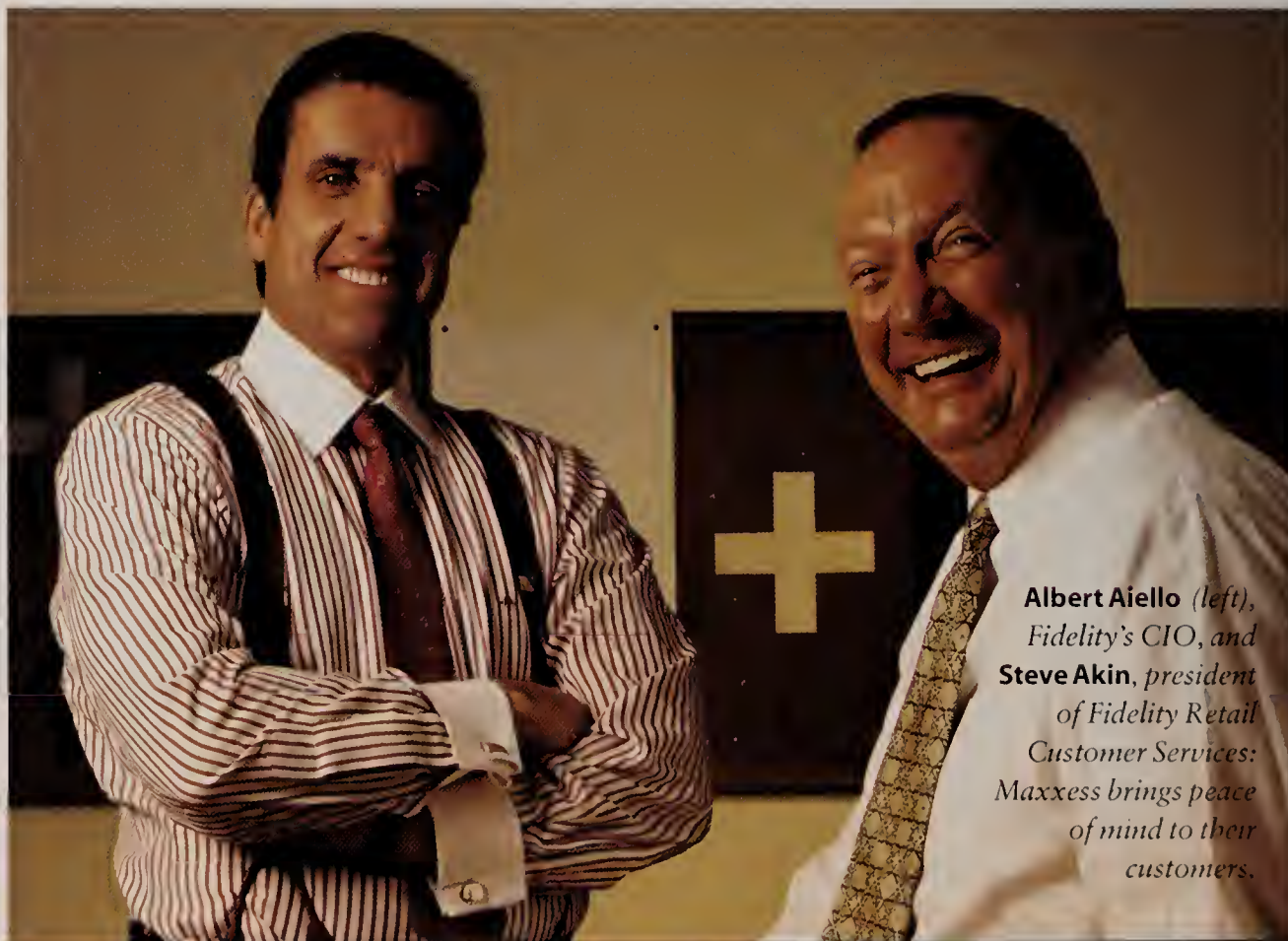
A \$9 million client/server system that provides up-to-the-minute financial information means peace of mind for customers and a competitive advantage for Fidelity

BY JENNIFER BRESNAHAN

WHEN HARRY DEAN awakes in the middle of the night fretting over his impending retirement, he knows what to do. Tiptoeing into the study to avoid waking his wife, he picks up the phone and dials the familiar number. Tonight, fortune is on his side; as he listens to the voice on the other end and pets his sleeping dog, his anxiety slowly dissipates. A simple call to financial ser-

vices giant Fidelity Investments' new automated voice-response system tells Dean all he wants to know about the financial world whenever he needs it most. By the time he hangs up, he's confident that his retirement planning is still on track: It's a warm fuzzy, Fidelity style.

The big "R" is a scary thing, but Fidelity's Maxxess, a \$9 million client/server system that provides up-to-the-minute financial informa-



Albert Aiello (left), Fidelity's CIO, and **Steve Akin**, president of Fidelity Retail Customer Services: Maxxess brings peace of mind to their customers.

tion via phone representatives, the Internet or a voice-automated system, is taking some of the uncertainty out of financial investment. Its reliability and simple interface makes interacting with Chairman Edward C. Johnson III's empire as easy to swallow as the banana cream pie Dean scarfs from the fridge on his way back to bed.

But Maxxess has a side customers never see. Behind the friendly interface is the hard glint of business ROI. Maxxess may bring peace of mind to customers, but it also allows the \$450 billion Fidelity to stay lean and mean in the face of competition. In the fast-paced world of retail stock brokerage, customers demand easy access to financial information, and financial services companies are around

DEFINING VALUE

Maxxess is a client/server application that delivers real-time market data to Fidelity's phone representatives, independent brokers, automated voice-response units and the Internet. Brokers are more productive, answering more calls and providing better information, and customer satisfaction has increased.

only as long as they keep it coming. "Maxxess fits our business needs at several levels, both functional and financial," says Albert Aiello, CIO of Fidelity Investments and president of Fidelity Investments Systems Co. (FISC) in Boston. "It's a bona fide ROI. Not every system does all that."

Before the advent of Maxxess in 1993, reps used a system that was akin to the caveman of customer service. When someone called for a stock price, a rep had to wait his or her "turn" for the computer terminal, which was mounted on a turntable and shared among three to five reps. When a customer called to request a quote, a rep would bring up that customer's information on his or her own desktop terminal, flip through paper directories to find the right stock abbreviation and wait for the shared quote terminal to be free. "I sometimes had to wait five minutes for a terminal," says brokerage Senior Trader Mike Manning. "I'd leave work at the end of the day feeling as if I couldn't give the customers what I was supposed to."

If the customer required additional information, such as a company's historical data or financial statements, the rep would have to put the caller on hold and trek across the room to a different, more expensive terminal that was shared by even more reps than the quote terminals. "By the time we got back to

the customer with the quote, it was old," says Manning. In the meantime, incoming calls queued up—a dangerous situation for a customer-service-oriented company. "Customers enter a zone of indifference when they have to wait, and they'll just go somewhere else for their information," explains FISC's senior vice president, Don Sundue.

To maintain that clumsy system, Fidelity was paying high monthly premiums to outside vendors for both quote-terminal hardware and the market data itself. The system's closed proprietary architecture prevented Fidelity from reusing the information or integrating it with Fidelity's customer data. And when Fidelity went on one of its frequent hiring binges, the company had to alert the ven-

dor weeks in advance that new terminals were needed. The combined aggravation of the staff's inefficient use of resources and the slow customer response time led Fidelity to conclude that something had to be done. Fierce competition and explosive growth—Fidelity had just opened retail branch offices in 80 locations in the

United States—only exacerbated the situation.

Aiello and Sundue had their work cut out for them. They knew they needed a system capable of processing data feeds from a variety of sources and distributing the data to thousands of remote and local desktops. They also needed an open architecture that could integrate customer and market data as well as Fidelity's "two of everything" computer environment. "You name it, we have it," says Sundue. The system had to be fast enough to absorb an ever-increasing volume of exchange-generated data—currently 560 messages per second, increasing by 25 percent each year. And the information it transferred couldn't be delayed by bandwidth limitations.

Aiello and Sundue toyed with the idea of buying an out-of-the-box system but ultimately opted to build. "If we went out and bought someone else's system off the shelf, we could get a reasonable facsimile of what we do here," says Sundue. "But we wouldn't get to control our own destiny."

What they and their colleagues at FISC came up with was a decision-support system that delivers real-time market data to automated telephone response machines, the Internet and more than 6,500 PC workstations. The original rollout was planned for 1,500 desktops in 1993, but the number increased daily as Fidelity grew. And because

"If we went out and bought someone else's system off the shelf, we could get a reasonable facsimile of what we do here. But we wouldn't get to control our own destiny."

—DON SUNDUE



WINNER PROFILE: FIDELITY INVESTMENTS

"It allows Fidelity to bring the heartbeat of the market to the telephone reps."

—JOHN HENDERSON

Maxxess is scalable, new PCs can be added in minutes.

Maxxess receives data feeds directly from sources such as the North American stock exchanges, news services, industry analysts and market monitors. An online cross-reference directory matches company names with stock symbols, eliminating the need to look them up in paper directories. The system's open architecture allows phone reps to integrate market data with Fidelity's customer portfolio information. And because the system is Microsoft Word-based, reps can cut and paste quotes or other information into an e-mail or fax for the customer. "Now one rep can do what two or three reps used to do,"

says Manning. Each brokerage rep answers 50 to 110 calls daily, totaling 70,000 to 90,000 per day for all the reps.

The Internet component of Maxxess, Maxxnet, is designed for people who need up-to-the-minute quotes only occasionally, such as independent brokers. The same information is available to them over the Web, but the user must reload the Web site continually to refresh prices.

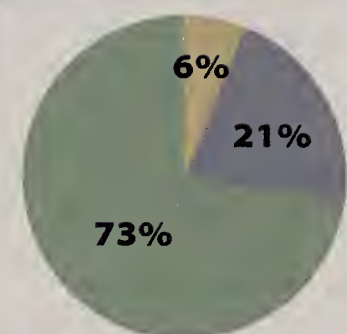
Maxxess is also integrated with automated voice-response machines that allow customers to retrieve account information and stock quotes via touch-tone phones. Seventy-five percent of Fidelity's calls, or about 210,000 to 270,000 per day, are handled via touch-tone. That's good news because computer-answered calls cost the company just 70 cents, compared with \$11 per call answered by a person. When the computer can't answer a question, it automatically transfers the caller to a rep, who knows not only that the customer was speaking to a computer but also what has transpired. "That's quite different from a lot of systems where voice recognition is one side, and if it doesn't work, you have to

THE NUMBERS: FIDELITY INVESTMENTS 1990-97

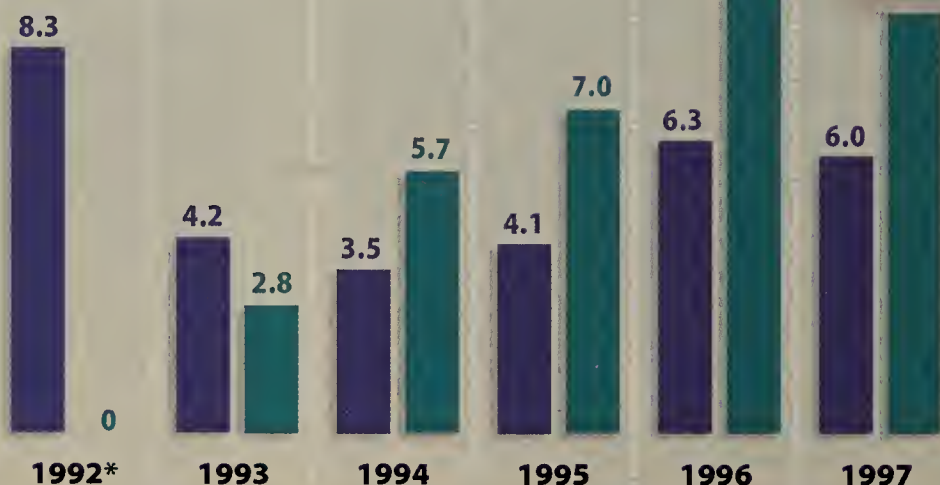
■ Total Investment (\$M)

■ Total Return (\$M)

WHERE DID THE MONEY GO?



■ Technology Purchases
■ Systems Development
■ Systems Maint./Training



*Data for 1992 includes investments made from 1990-92.

THE BOTTOM LINE

Total Gross Investment: \$32.4M | Total Gross Return: \$52.9M

Net ROI = 62.8%

WHY ARE SYSTEMS MAINTENANCE and training costs so high?

Sundue explains: "This number is the cost of the whole infrastructure; it's the ticker plant, the fault-tolerant hardware, the client/server operations group in Marlboro, Mass., that provides constant coverage, the telephone lines that connect us with the exchanges.... It's also the maintenance cost for responding to the changing marketplace that we can't control. For example, the New York Stock Exchange might call and say, 'We're changing our format for so-and-so by this date.' We don't have any choice."

start all over again talking to a person," says John C. Henderson, professor of MIS and director of the Systems Research Center at Boston University and a member of the EVA Process Team.

But the decision-support system is only the beginning, according to Henderson. What's really impressive lies below the surface. "There are two pieces to this system," he says. "The first piece is the glitter—the decision-support system. But what really makes it is the information infrastructure underneath: the people and processes, not just the computers. It's that infrastructure that allows Fidelity to bring the heartbeat of the market to the telephone reps."

Maxxess is based on a three-tiered architecture that prevents circuit overload by automatically detecting disconnects and rerouting



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WINNER PROFILE: FIDELITY INVESTMENTS

ANATOMY OF THE SYSTEM

Hardware: Phone reps use PCs, minimum 486; tier 1 and 2 servers are Intel-based PCs with Pentium 64MB memory; the head-end ticker plant is a Stratus fault-tolerant system; Sun Sparc Systems are used for the auxiliary data servers; voice-response units are RS6000 and Aspect Switches.

Software: Maxxess is an in-house Microsoft Windows-based application running on C++, Windows 3.1, 95, NT and any platform with an HTML browser; tier 1 and 2 servers run C and SCO Unix with a proprietary in-memory database; the head-end ticker plant runs C and VOX OS; auxiliary data servers run C, Sun OS or Solaris and Sybase DBMS; C and AIX is used for the voice-response unit; software development tools include: Microsoft Visual C++, PVCS for source code control, SQA Robot and SQA Manager for QA, SCCS for source-code control, and Purify and GDB for debugging.

Architecture: Maxxess operates in a client/server architecture with TCP/IP protocol over a corporatewide LAN and WAN. The WAN extends to external customers.

messages. Three tiers of servers feed data from the exchanges, vendors and third parties to Fidelity's brokers. To prevent mass downloads that slow down the system, the local servers store market data only on funds and stocks that are requested most often. "So, if I'm in the Midwest, I'm probably looking at mid-western and blue-chip companies," explains Henderson. When a phone rep needs information that isn't usually requested, he is transferred seamlessly to regional or national servers.

And as if just keeping the thing running weren't enough, FISC has decreed that Maxxess must be available 99.85 percent of the time. That's less than one interruption per month. Sounds unrealistic, until you realize that Maxxess is "blowing the socks off" that goal now with less than one major failure every two months, says Sundue. And in instances when it's impossible to deliver pure, timely data, the system freezes. "If there's a circuit problem, we shut down the system instead of giving bad data," says Ken McKay,

quotes and investment information to their customers. The revenues generated from external Maxxess sales "aren't that significant for Fidelity, the mother company, because we're too big," says Mark Wildermuth, senior vice president of Fidelity Brokerage Technology Group. "But we figured it's better to get a little piece of the action than none at all. In the end, it keeps us more competitive and efficient. An element of change driving through the organization keeps us from getting big, fat, dumb and lazy."

Wildermuth has found that being associated with Fidelity is a mixed blessing for product sales. "Having Fidelity's name opens doors," he says. "But sometimes people don't want to rely on Fidelity for all of their financial services needs." But Aiello maintains that Maxxess makes it harder for the people who buy the system to leave. "This is a strategic offering," he says. "It makes our relationships more valuable."

Now that Maxxess is in place, the potential for new uses is unlimited. Companion

"An element of change driving through the organization keeps us from getting fat, dumb and lazy."

—MARK WILDERMUTH

FISC's director of client/server operations.

McKay's group is charged with fixing whatever ails Maxxess, 24 hours a day, 7 days a week—not a minor task considering that software, hardware, telephone circuitry or network componentry could go wrong at either Fidelity's network or any of the companies that contribute to Maxxess. "All of these have to work," says McKay. "If there's a problem at any one of these points, the end user immediately knows." Amazingly, Maxxess experiences only one or two minor glitches per day—which is just as well for McKay and his team because when a problem occurs, they don't go home until the problem is traced back to its source and solved.

Since Maxxess's implementation in 1993, it has saved Fidelity \$20.5 million net in outside vendor costs and human resources and offered the hard-to-quantify benefit of increased customer rep productivity. In addition, it now generates its own revenue as a commercial product. More than 100 full-service and discount brokers, banks and insurance companies have purchased direct links to the system, allowing them to offer real-time

products are already being developed that benefit both the customers and employees of other companies. That includes software products such as prospect management software as well as financial service offerings including 401(k) information and benefits processing.

"The ability to run this national network computer infrastructure is now a core competency of Fidelity," says Boston University's Henderson. "It is something that will provide significant competitive advantage as they move to knowledge-based products. Maxxess is just the first example of what they can do now that they have the information infrastructure."

But all that is unimportant to customers like Harry Dean. The system's behind-the-scenes intricacies are lost on him as he places his call in the middle of the night. To him, the most impressive thing about Maxxess is that it gives him peace of mind so that he can go back to sleep. 

Staff Writer Jennifer Bresnahan can be reached at jennifer@cio.com.

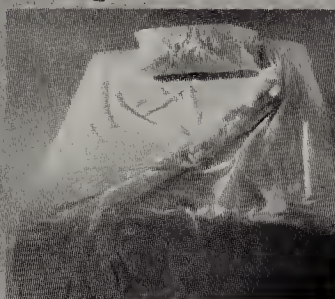
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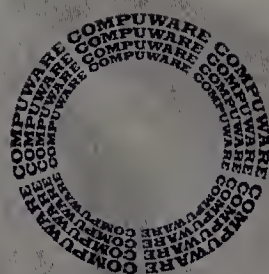
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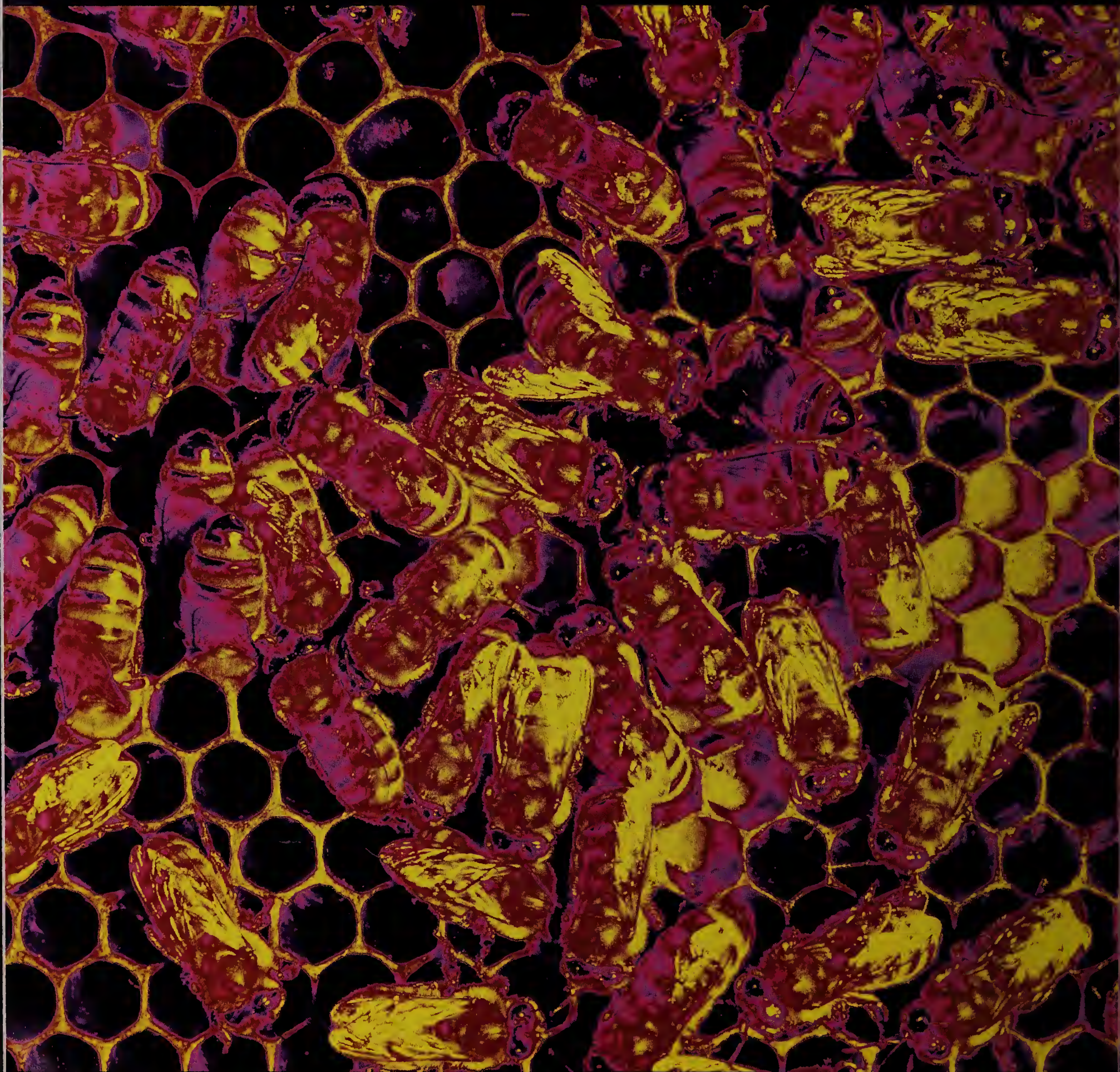


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WINNER PROFILE: BELL ATLANTIC

A GOOD CONNECTION

This Baby Bell improved communication and profits by cutting the static between salespeople and customers

BY TOM FIELD

WHEN BRUCE GORDON went to work for the telephone company in 1968, he had exactly two products to sell: touch-tone service and colored telephones. Twenty-nine years later, as group president of Bell Atlantic Corp.'s Consumer/Small Business Services Division in Arlington, Va., Gordon oversees sales representatives who sell Call Waiting, CallerID Deluxe, home voice-mail services and dozens more voice and data products that enhance basic telephone service. "And if we don't double our product line in three years, fire me," Gordon says. "I won't have done my job."

The product line is not all that has changed during Gordon's tenure. When he joined the phone company, it was just that—the phone company, part of the giant Bell System that dominated U.S. telephone service until it was divided up and Bell Atlantic was formed in 1984. Today, Bell Atlantic—one of the Regional Bell Operating Companies (RBOCs), or "Baby Bells," spawned by the breakup—is the local telephone service provider for 16 million customers in Delaware, New Jersey, Maryland, Pennsylvania, Virginia, West Virginia and the District of Columbia; and it hopes to expand northward through a planned merger with



Gary Weisenborn (left) and Bruce Gordon: As Bell Atlantic grows, so does the competition.

New York-based Nynex Corp.

But as Bell Atlantic grows, so does the competition. Already, the company faces tough opposition in its local cellular and data markets, and now, with the passage of the federal Telecommunications Act of 1996, Bell Atlantic will have to compete for the first time with such giants as MCI Telecommunications Corp. in both the long distance and local telecommunications markets.

The telephone company's burgeoning product line and increased competition forced Bell Atlantic Information Systems (BAIS), its corporate IS unit, to look for new ways to sell more products more effectively and to prepare to compete in an open market. As a result, BAIS joined Gordon's division in creating a

ment saw the potential to use the onscreen cues to alert reps to Bell Atlantic products that best match customers' needs. Gordon says his unit has seen a 30 percent increase in consumer product sales over the last three years, and SSNS has become a major part of Bell Atlantic's growth strategy.

The system has been pivotal to Bell's transition from corporate offspring of a monopoly to tough competitor in an open market, says Alexander E. Dean, managing partner for Andersen Consulting LLP's southeast U.S. region and an analyst of the telecommunications industry. Dean calls the system one of the best sales and marketing tools he has seen in the telecommunications industry. Customer service will be the key metric in the new

telecommunications market, Dean says, and systems such as SSNS can help companies gain a competitive edge. Already, SSNS has instilled a new customer-friendly attitude in sales representatives, says Kathleen Eisenhart, Bell Atlantic executive director of small business. "That represents a culture change from a monopoly mind-set of 'They need us' to 'How can we help you?'"

To understand why SSNS

is a success, one must understand what it replaced. Bonita Banks, a sales consultant who has been with Bell Atlantic for 20 years, remembers the pre-SSNS days when she had to hand-write order information from customers, try to match those customers needs with Bell Atlantic's ever-growing product list and translate the handwritten notes into the complicated Bell Universal Service Order Code (USOC), a cumbersome alpha-numeric coding system that, to users, was like a foreign language. Customers frequently were put on hold while representatives contacted outside agencies for credit and address verification. When the orders were entered incorrectly, the customers called back and the laborious process began again. When customers called back with questions after the initial service hookup, the representatives had little more than basic billing information at their fingertips.

Now, with SSNS, the order process is more like an interview guided by the system. During the sales call, as the consultant learns more about the customer and enters that information directly into the system, SSNS tailors a response. Say, for instance, that a residential

"We've gone from
just order-taking
to needs-based
sales, which is
important in
a competitive
environment."

—GARY WEISENBORN

DEFINING VALUE

SaleService Negotiation System uses advanced client/server technology to provide a shared corporate data environment. Bell Atlantic's consumer and small-business sales representatives concentrate less on the sales and data-entry processes and more on the customer, thus increasing profitability, increasing hourly sales, decreasing service order errors, reducing new-hire training time and cutting the cost of training and methods and procedures distribution.

new service-order-entry system called SaleService Negotiation System (SSNS). The Windows-based client/server application has created a more profitable relationship between Bell Atlantic's customers and its 6,500-plus consumer and small-business telephone sales representatives.

Introduced in 1993, SSNS is a one-stop data mart for customer, sales and product information. It replaced three individual legacy systems with a new, intuitive application that, using on-screen prompts, smoothly guides sales representatives through an order cycle. "We've gone from just order-taking to needs-based sales, which is important in a competitive environment," says Gary R. Weisenborn, vice president of Information Systems-Business Systems, which led the SSNS project. "We're reducing the number of callbacks from customers who don't get the right service the first time, and we're selling more products."

Initially, SSNS's basic goals were to minimize errors and reduce the time customer service reps spent on the phone with customers—and to make dealing with the phone company a lot easier than customers had come to expect. But as the sales reps adopted the system, manage-



WINNER PROFILE: BELL ATLANTIC

"The customer is often willing to thank me, which wasn't the case before."

—BONITA BANKS

customer has teenagers in the house. When that information is entered, SSNS's SalesCue feature tells the consultant to recommend Bell Atlantic's Call Waiting service. For a business customer, the similar SalesTool feature might suggest CallerID or Answer Call, a dial-up voice-mail service maintained by Bell Atlantic. New products, which representatives previously had to memorize and try to work into their sales processes, now appear automatically with a sales pitch script. Products and services are added to a customer's account, representatives have access to billing information, and SSNS even performs address and credit verification through ties to remote databases so that customers don't languish on hold. SSNS also creates automatic service verifica-

tion letters for customers, and it gives representatives information on service inquiries.

The result of SSNS is an initial sales call that is not necessarily shorter than calls made under the previous system—representatives say some of their calls actually are longer because they pitch more products—but that fosters greater productivity (an 18 to 20 percent improvement) and better customer relationships because of the consultant's ability to better meet the needs of the customer. "The customer is usually pleased by the time we're finished," says Banks. "They're often willing to thank me [for the service]. That wasn't always the case before."

"It's a lot quicker for me," says Debra Melvin, a specialist in the Training Delivery group and a six-year Bell employee who currently works in Philadelphia. "I'm treating customers a lot more like people, not just numbers."

But the numbers are what really make SSNS stand out. Since 1993, SSNS has increased sales rep revenues per hour by 84 percent, decreased service order errors by 98 percent, reduced new-hire training time by 66 percent and reduced the cost of training by 90 percent.

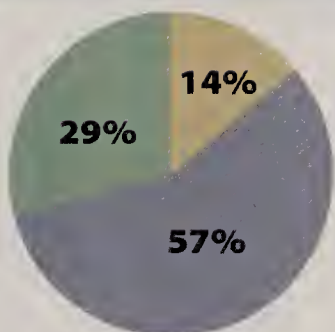
Since rolling out SSNS, Bell Atlantic has reduced consultant training time from six weeks to two days by replacing the USOC commands with plain English and by putting much of the information online that previously was found in a 20-volume handbook.

THE NUMBERS: BELL ATLANTIC 1994-99

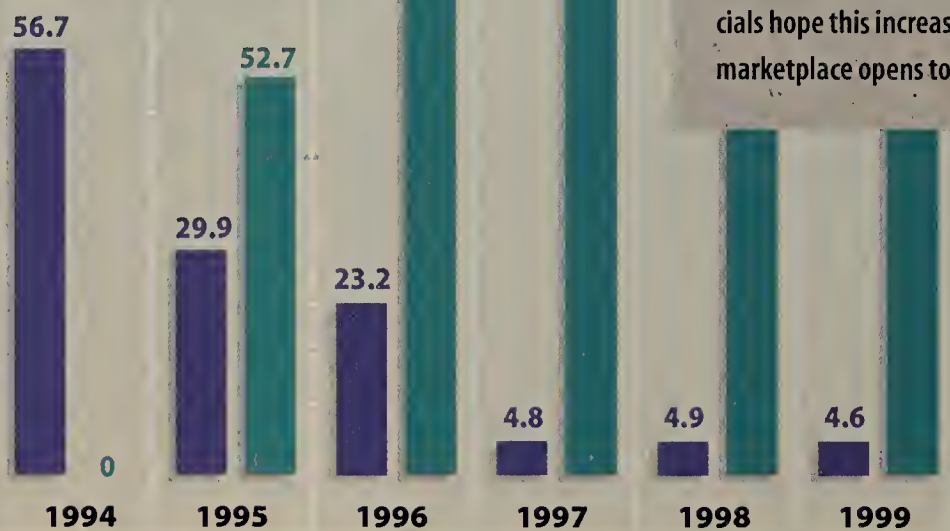
■ Total Investment (\$M)

■ Total Return (\$M)

WHERE DID THE MONEY GO?



■ Technology Purchases
■ Systems Development
■ Systems Maintenance



BECAUSE BELL ATLANTIC CURRENTLY OPERATES in a monopoly market and serves a near-captive audience, the ROI figures cannot be used to determine how SSNS has helped the company improve market share. But the numbers do suggest that Bell Atlantic is selling more products to its existing customer base, and company officials hope this increased penetration will breed greater brand loyalty when the marketplace opens to competition in the near future.

By 1999, Bell Atlantic anticipates investing just over \$124 million in SSNS while saving nearly \$567 million, for a total projected return of \$443 million. And although market share is not a relevant measure, since until now Bell Atlantic has enjoyed a monopoly, penetration rate—the volume of "extra" Bell Atlantic products sold within the captive market—is a viable metric, and executives say SSNS has helped produce a three-year 30 percent annual increase in sales of optional services.

Beyond basic ROI, the SSNS project also has inspired a collaborative relationship between IS and Bell Atlantic's business side. Weisenborn says his team never could have built an adequate IT solution if the SSNS business partners

THE BOTTOM LINE

Total Gross Investment: \$124.1M | Total Gross Return: \$566.6M

Net ROI = 357%



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WINNER PROFILE: BELL ATLANTIC

ANATOMY OF THE SYSTEM

Hardware: Operations environment employs Sun Sparc servers running Unix; X-Windows/Motif GUI is delivered on X-terminals supplied by Tektronix and Hewlett-Packard; production configuration includes Sun symmetrical multiprocessing servers; corporate data is housed in an IBM MVS/DB2 environment.

Software: SSNS was developed in-house using C/C++ programs and a variety of packaged development tools, including Sybase relational database system, PeerLogic PIPES messaging software, UIM/X MOTIF-GUI builder and ART/IM rule-based knowledge system.

Architecture: SSNS is platform independent and operates on approximately 100 distributed Ethernet LANs connected by a WAN utilizing the TCP/IP protocol.

had not worked closely with IS to define the problem. And he credits the users with offering valuable feedback. "User/sponsors helped point out problems and get IS to address the issues," Weisenborn says. "Without that effort, the project would have died."

Patricia Toregas, manager of desktop delivery for consumer sales in Bell Atlantic's Silver Spring, Md., office, agrees that the collaboration was key to the SSNS success, and she credits IS with encouraging, not just listening to, user input. "This is the first IS project within Bell Atlantic where, from the beginning, users have been involved in the development,"

use it. IS and the business departments eventually developed mutual trust, and the representatives came to realize that mastering SSNS was to their benefit. "The training was a little tricky at first, but in a week I was really into it," says Banks. "I find myself able to talk with twice as many customers as I used to."

As of November 1996, SSNS had been adopted by nearly 100 percent of the consumer/small business division's sales representatives (because the rollout is gradual, some of the small-business representatives are not online yet), and it currently is being modified with Java to work as a more dynamic

"Implementation was as much or more of a challenge as developing the system."

—GARY WEISENBORN

Toregas says. "It really paid off."

Which is not to say implementing SSNS was without its challenges. For one, developing a common repository for customer data was difficult, Weisenborn says. The scale of the project also was overwhelming—thousands of users at dozens of sites in several states. The system even had to be customized in some states, where regulatory agencies require Bell Atlantic to disclose some specific product information upfront to customers. At the outset of the SSNS rollout, Weisenborn's team had to install servers, desktop equipment, the network and the management system at 80 sites in one weekend. "Implementation was as much or more of a challenge as developing the system," Weisenborn says.

Beyond the technical roadblocks inherent in any IT project, the greater challenge was changing longstanding business processes. SSNS replaced some legacy systems and the old service-order language was built around the arcane USOC, which had been standard operating procedure in the old Bell System. There were, in fact, some veteran sales representatives who prided themselves on their mastery of the old system. Introducing a new application and trashing the old coding was a revolutionary change that challenged those veterans to develop new skills.

Initially, there were some performance issues, Eisenhart says, but they were dealt with by having users work side-by-side with software engineers. Subsequently, some users were trained to be system advocates who helped explain the technology and train other representatives to

intranet version accessible to mobile representatives. The SSNS success—and the IS/business partnership—also is the foundation for new integrated applications such as a work-in-progress billing application that is part of Bell Atlantic's overall business reengineering initiative. If the Bell Atlantic/Nynex merger proceeds, company executives say, then SSNS likely will be not only the companywide customer service system of choice, but also the most widely deployed system in the telecommunications industry.

Weisenborn says hindsight has given him a greater appreciation of the scope of the undertaking. "So often we in IS reflect on what we haven't done yet or what we have to fix," he says. "Looking back on the SSNS project gives us a chance to look at what we *have* done."

Of course, as Andersen's Dean points out, "In this business, nothing is sacred for more than 12 or 18 months." For Bell Atlantic to stay ahead of its new competition, it must continue to refine not just SSNS, but all of its business and customer service processes. That is a whole new mind-set for a company used to being the only game in town. Customer service will be the premium in the new, open market, and Bell Atlantic's pressure will be not just to serve its customer base, but to expand it. In light of that goal, Gordon says, the system could not be more strategic. "The monopoly is over," he acknowledges. "We have to service and sell far more competitively." **CIO**

Staff Writer Tom Field can be reached at tfield@cio.com.



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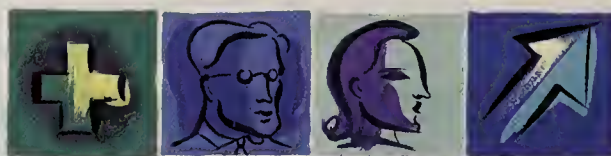


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WINNER PROFILE: SCHLUMBERGER

NET RESULTS

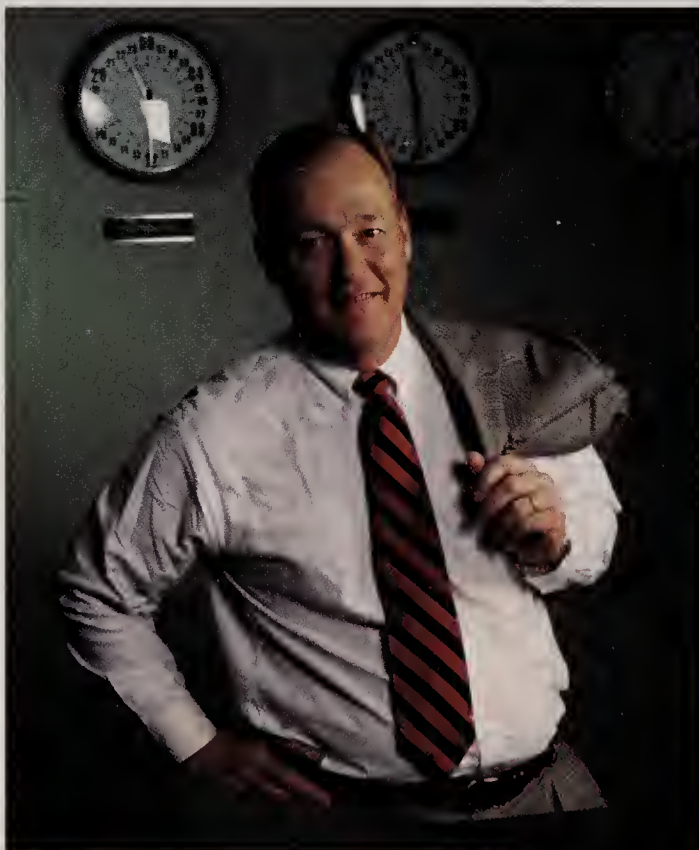
In 1991, building a worldwide corporate network based on TCP/IP struck Schlumberger as a wise move. Today, the company is using the network to help its clients strike oil.

BY E. B. BAATZ

AT A REMOTE OIL-WELL SITE in the heart of the Arabian Desert, a lone engineer's pumping-parameter recorder spews forth data the likes of which he's never seen. A \$2 million deal for improving the Arabs'

oil yield hangs in the balance, but in his momentary panic, all he sees is what Lawrence of Arabia called a "pathless sea of sand."

But wait. His truck with its satellite dish on top is parked nearby. He posts an urgent mes-



David Sims (above) aimed to put information only a few mouse-clicks away from remote workers.

Victor Grijalva (below) says the biggest obstacle to SINet was technical.



sage to senior engineers in France, who tell him to check the connection to the programmable optimum density blender. He does. Now the stats spitting out of the recorder make sense.

For New York-based Schlumberger Ltd., which pioneered a private, Internet-connected communications infrastructure, that scenario is not at all far-fetched. In fact, an e-mail of thanks from a young engineer who used the network for troubleshooting in the desert is now part of corporate lore at the \$7.5 billion manufacturer of testing and measurement equipment and provider of high-tech services to oil companies.

With more than 50,000 employees of 75

DEFINING VALUE

In 1991, Schlumberger created an intranet with satellite links to remote sites that makes unhindered global communications possible and provides the backbone for client/server IT projects that save money and create new revenue.

nationalities operating in more than 90 countries (many at remote, hard-to-reach locations in the middle of the desert) the Schlumberger Information Network (SINet) was designed first and foremost to connect everyone, everywhere—by satellite if necessary. But today, the ubiquitous SINet helps the business in many other ways, too. Employees can download design tools on the computer, helping to reduce the time from oil-field research to well-site launch from four years to 18 months.

It's now possible to provide real-time updates of technical documentation and hazardous waste manuals. The network also enables collaboration with scientists and engineers at universities around the globe and helps Schlumberger solve customer problems quickly. Employee productivity is enhanced as well because information sharing helps reduce redundant work.

Back in 1984, long before the term "intranet" had even been coined, Schlumberger began blazing a new communications path with a mandate from the top. Shortly after the CEO and chief technical officer authorized the trek into the then-largely uncharted world of corporate networking, the company connected research labs in Paris, Tokyo, Houston, Ridgefield, Conn., and Cambridge, England, through a series of proprietary networks.

But by the late 1980s, burgeoning costs and the confusion engendered by multiple proprietary networks had management concerned.

For example, in Schlumberger's Wireline business, operations and research used a DECnet, manufacturing had an SNA network and field folks used a 5211 multidrop network.

In 1991, Schlumberger decided to chart an aggressive—some would say risky—Internet-based strategy for its international network. "The biggest obstacle was technical," says Victor E. Grijalva, executive vice president of oil-field services. "Nothing like SINet had existed before." As far as the folks at Schlumberger knew, at the time hardly anyone else in corporate America was pursuing such a networking topology. But for a company loaded with engineers and scientists—who were already Internet devotees—the technical challenges were not permanent barriers.

"Because we'd had a private corporate network since 1985, the evolution to an Internet-style, open architecture network was seen as a way to improve performance and achieve a high level of interoperability—Schlumberger has at least one of every kind of computer ever invented—while at the same time reducing costs," says David P. Sims, technical manager for information technology in Schlumberger's Sugarland, Texas, office.

As network development expenses soared, the risks for a frugal company accustomed to keeping a close eye on the bottom line loomed. Twenty percent annual increases in network costs were not unusual. "It was a surprise to us that the needs of the network kept growing and growing," says Grijalva.

The company invested \$6.5 million to pursue a seamless, integrated network between 1989 and 1991. By 1996, annual expenditures for hardware and software, training, and operational expenses had reached \$17.6 million. All told, between 1989 and 1996 Schlumberger put \$72 million in the network.

"Even today the network demand increases at a rate of 4 to 10 percent per month," says Jimmie Keddle, technical manager for the commercial SINet spinoff called Omnes, a 1994 joint venture between Schlumberger and U.K.-based Cable and Wireless Ltd. "Given rampant growth, the company became fearful of runaway costs and diverging efforts," says Keddle.

When the company decided in 1991 that it should pursue a TCP/IP protocol for all new equipment, exempting upper managers who continued to rely on AppleTalk, the network wars began. "Management divided into two camps, those who believed in the network and those who wanted the costs off their books,"

"In my first year as vice president of IT, I stood up and said the network usage is increasing, and we're increasing costs by 20 percent per year. Of course, everyone threw rocks; it's an annual event."

—LARRY GUTMAN



WINNER PROFILE: SCHLUMBERGER

"Whenever there
is a failure of the
network, I feel
naked."

—VICTOR GRIJALVA

recalls Keddie.

"Schlumberger is a very decentralized company, and the field managers have a great deal of autonomy," explains Bruce McCann, vice president and general manager of the Houston Product Center for the wireline and testing division. "There is a tendency, of course, not to like costs that you can't directly control. And the network costs sit in the budget as a very visible lump sum."

How to charge the divisions for the network was a make-or-break issue for the nascent network. "At first we captured the costs and distributed them based on usage, but that didn't work," says Grijalva.

"The money had been spent on the network, and there was a battle going on to see

who could use it the least," says McCann. Then the company tried a brute force method, where the biggest revenue-earners paid the most. "We are moving now to a more exact way of negotiated payments as if the [internal customers] were getting the service from an outside vendor," says Grijalva.

That's not to say that the network wars are over. Schlumberger's top IS executive understands both sides. A former field engineer who has had experience in marketing and operations during his 20 years at the company, Larry Gutman was named vice president of IT just over two years ago and is now responsible for deploying a huge SAP enterprise resource planning software package over the SINet infrastructure.

"In my first year as vice president of IT, I stood up and said the network usage is increasing, and we're increasing costs by 20 percent per year," says Gutman. "Of course, everyone threw rocks; it's an annual event." In his second year, Gutman shifted his strategy to trying to determine the value of the IT investment. "That's a challenging job, but it can be done, at least anecdotally," he says.

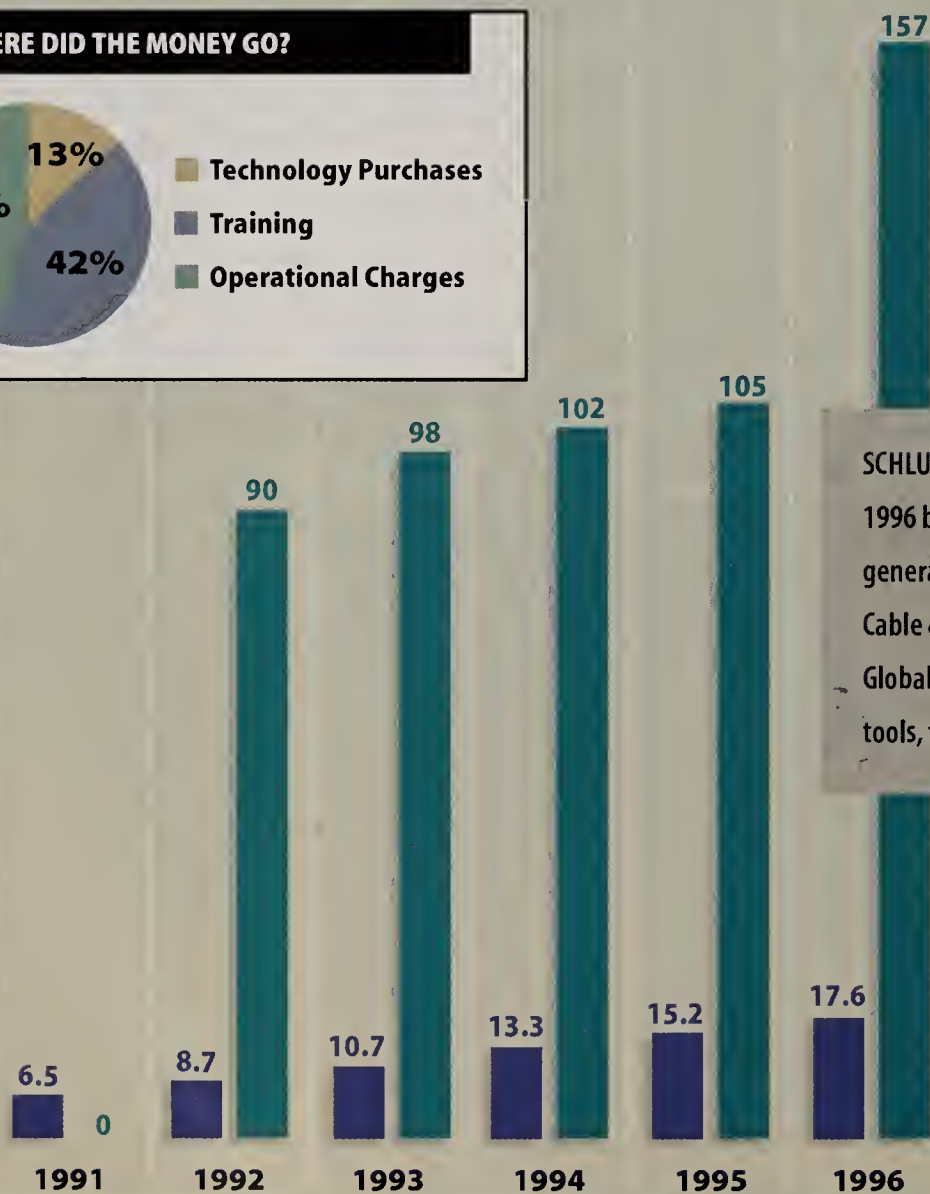
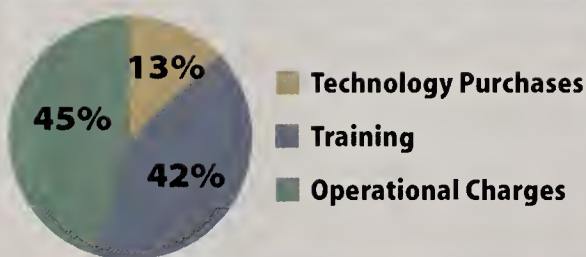
For example, Schlumberger operates huge seismic research vessels that collect terabytes of data on rock formations and oil deposits beneath the ocean floor. Supercomputers have reduced the time required to process the data

THE NUMBERS: SCHLUMBERGER 1991-96

■ Total Investment (\$M)

■ Total Return (\$M)

WHERE DID THE MONEY GO?



SCHLUMBERGER'S RETURN on its networking investment took off in 1996 because two spinoff companies that grew out of SINet began generating significant revenue streams. Omnes, the Schlumberger/Cable & Wireless telecommunications services joint venture, and GlobalSoft, a new company formed to sell software development tools, together generated around \$70 million in 1996.

from several months to just weeks. But getting the data to the client sometimes still requires loading and shipping pallets of tapes to the customer.

Continued investments in state-of-the-art networks, however, could change all that. "We're testing a high-performance trial network, and it took only eight days for the data to be transferred," says Gutman. The time and cost savings, of course, will be measured.

Quantifying the impact of the network on costs, though a difficult task, is important to Schlumberger. Since 1991, the company has conducted two internal audits of all communications costs, including expenses for airline

THE BOTTOM LINE

Total Gross Investment: \$72M | Gross Return: \$552M

Net ROI = 668%



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WINNER PROFILE: SCHLUMBERGER

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deployed worldwide
over SINet to the
oil-field services
product centers
have saved nearly
\$55 million in IT
costs since 1993.

travel for face-to-face meetings, telephone and network charges, and overnight mail and courier service fees. The findings from the second audit in 1993: Total communications costs decreased by 2 percent. "That decrease may not seem like much," says Sims, "but it came despite the fact that we spent \$5 million more on the network than [we had] the previous year, and it amounted to a \$2 million reduction." Now, as the company's search for meaningful network metrics continues, consultants from Stamford, Conn.-based Gartner Group Inc. have been hired to study how Schlumberger's communications costs compare with those of other companies.

Cost savings are important, but it's the strategic nature of the network that keeps management online. In fact, Sims offers Schlumberger's managers the "golden ax." As Gutman recalls, Sims told them "if the costs get too much for you, just cut it off." No one has taken this route, of course.

One reason is that more and more applications are being layered on the network, the benefits of which have been easy to measure. For example, product-data management software from Sherpa Corp. and materials resource planning software from QAD deployed worldwide in the oil-field services product centers have saved nearly \$55 million in IT costs since 1993.

Those investments, Grijalva figures, allow fewer people to do more work. In the past, the company had one sales representative for every 40 customers. Now the ratio is 1-to-300. Revenue per employee, a coarse measure of corporate efficiency, looks impressive as well. Between 1991 and 1995, revenues grew 26.5 percent while head count fell 6.3 percent. At \$149,000 in sales per employee per year, Schlumberger outperforms its closest competitor by 50 percent.

It's not just numbers that keep SINet rolling but a sense that the network has changed the business in fundamental ways. For keeping up

with fast-paced emergencies, constant access to SINet has become the executive's lifeline. "Whenever there is a failure [of the network], I feel naked," says Grijalva.

For customers, too, SINet has become an important selling point, and that means revenue. Indeed, Schlumberger calculates that from 1992 to 1996, revenues were enhanced by a whopping \$552 million thanks to new revenue streams and productivity improvements. For example, just in the past year, SINet has been used by an oil company client in Texas called Pogo Corp. "For the first time ever, there

is a team in charge in Houston controlling the oil rig in Thailand," says Grijalva. "The data is being transmitted in real-time." When the company was lobbying for the Pogo contract, SINet proved to be an invaluable competitive advantage.

Sims attributes a multitude of other benefits to the SINet investments, too. For example, the network allowed Schlumberger to consolidate computation resources from 15 seismic data processing centers located around the world to two, one in Houston and one in London. Access to the Internet also has provided Schlumberger with free software. To create its online employee directory, for instance, Schlumberger downloaded public domain software called Ph/Qi from the University of Illinois at Urbana-Champaign. Design files for downhole tools are online now, too,

which have helped shorten the time to market for oil-field services' new products.

But the biggest beneficiary of the network, says Sims, probably will be the next young engineer stuck at a remote well site thousands of miles from a Schlumberger support base. "Through the network, help or advice from some of the most senior and experienced people is now only a few mouse-clicks away," he says. **CIO**

Senior Editor E.B. Baatz is leaving CIO to help launch an economic information service, Thinking Cap Solutions.

ANATOMY OF THE SYSTEM

Hardware: 50 Newbridge multiplexers, 500 Cisco routers plus 150 access servers, 1,750 Cabletron Ethernet hubs, 2,000 ZyXel modems, more than 22,000 desktop systems of all types.

Software: Netscape Navigator browser, Lycos search engine, Ph/Qi directory, Qualcomm's Eudora for e-mail.

The Network: Uses the TCP/IP protocol and serves 22,000 users in more than 500 locations. More than 100 internal Web servers and 30 Gopher servers. Bandwidth from 4.8Kbps to 45Mbps. BBN equipment is also used for some terrestrial data transmissions and Hughes VSAT satellites provide access from remote sites in West Africa and elsewhere.

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WINNER PROFILE: CHASE MANHATTAN

BANKING ON THE RELATIONSHIP

IS helped the nation's largest bank develop more profitable relationships with its small and midsize business customers

BY TOM FIELD

FRANK LOURENSO, executive vice president of The Chase Manhattan Corp.'s Middle Market Banking Group (MMBG), used to walk into sales meetings and ask, "How many relationships do you manage?" Inevitably, the sales staff would answer, "about 100" or "about 120." Lourenso would shake his head in frustration. "If I were a car salesman," he would say, "I'd know exactly how many cars were on my lot—not just 'about' how

many—and I'd know who my customers were."

Not that Lourenso wants his salespeople to emulate car salesmen; he simply feels that, as the owners of 50 percent of the market share of business banking services to small and midsize companies in the New York/New Jersey/

Denis O'Leary (left) and Frank Lourenso: With help from the RMS development team (right), they formed a partnership at Chase.



Connecticut tri-state region, they should *know* who their customers are, which bank products they use and how they can be encouraged to buy more products in the future.

To gain that knowledge, Chase's sales reps used to have to devote an inordinate amount of time to extracting customer and product data from several independent bank information systems. Just collecting that information, much less making sense of it, took far more time than they could afford to spend actually working with their customers.

That quandary led to the development of

DEFINING VALUE

Relationship Management System (RMS) provides the bank's middle-market relationship managers and their supervisors with a consolidated view of customer information. RMS gives users greater access to current customer information, and it reduces the time it takes to gather that data from various legacy systems. Relationship managers now can devote more time—and more information resources—to maximizing and expanding their customer base.

Chase Manhattan's Relationship Management System (RMS), a Windows-based, client/server system that gives salespeople a single, intuitive interface to multiple types of middle-market customer data such as credit balance and transactions. By joining Chase's legacy applications with new PC/LAN/WAN technology, RMS minimizes the amount of time reps spend looking for customer data, thus freeing them up to cultivate customer relationships.

RMS originated in 1994 at Chemical Bank, which, prior to its 1996 merger with Chase Manhattan, was a major player in the tri-state middle-market banking business. Since its initial rollout, about two-thirds of MMBG's 1,000 reps within the merged banks have adopted RMS, and the system is credited with increasing customer calls and product sales significantly. "We now have a simpler information environment that makes it easier to handle the increasing complexity of the bank," says system developer John McFadden, vice president and department head of Commercial Lending Reengineering and Middle Market Management Systems for Chase Manhattan.

The impetus for building the system came from Lourenso, then head of Chemical's middle-market strategy, who had misgivings about the bank's uninspired use of technology. Each of Chemical's bank units maintained exceptional databases of customer information, including the Customer and Product Reporting System (CAPRS), which offered customer

information to reps, and the Financial Management Reporting (FMR) system, which tracked profitability data for senior managers. But that wealth of customer information often was inconsistent or duplicated across the various individual databases and could not be accessed using one interface. "We just were not embracing technology to the degree that we would have liked to," says Lourenso.

Reps could cobble together customer portfolios only by dipping into several information systems and wasting a lot of paper. By the time they finished, the information was outdated.

Similarly, senior managers worried that MMBG was being plagued by the old 80/20 rule—that 20 percent of MMBG's customers were generating 80 percent of the unit's annual income. Lourenso feared the reps, in trying to serve everybody equally, might be paying too much attention to smaller accounts and not enough to their most prof-

itable ones. Yet without an information system that could readily and reliably assimilate all its customer data, Chase had no way to identify those preferred customers.

System maintenance was a nightmare, too. Something as simple as changing a customer's address required a salesperson to send as many as eight separate memos to individual systems operators to ensure the change was made throughout the legacy system.

The sales reps' lack of interest in IT didn't help, either. That attitude had been noted as early as 1990, when Chemical switched its voice/data network from a Wang platform to a PC/LAN. Chase Manhattan's Information Technology and Operations (IT&O) was excited about the move to RMS, says Amy Hirson, now vice president of Middle Market Information and Management Systems, and subsequently developed several applications that the technologists thought would be useful to reps. But when IT&O demonstrated those systems to users and asked if they could use them, Hirson says, the polite reply was, "I don't think so."

That indifference to IT also was documented in a 1993 Barlow Research survey that found MMBG's top-performing reps didn't feel IT was instrumental to their success. In response to those findings, McFadden and Hirson gathered some salespeople and for the first time simply asked them, "How can we *help* you?"

Their answer: They needed exactly what

"We now have a
simpler information
environment that
makes it easier
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—JOHN MCFADDEN



WINNER PROFILE: CHASE MANHATTAN

"If it is right in
RMS, it is right
everywhere."

—AMY HIRSON

Lourenso had identified—a single, simple way to view and manage customer data. RMS was conceived at that meeting, and it became a full-blown project early in 1994, when Lourenso chartered a multidisciplinary technology advisory board whose principal task was RMS development. At the same time, IT&O was creating a virtual Global Exposure System (GES), a fast, friendly system for users to access MMBG credit information. Because GES and RMS shared the same objective—to provide an open architecture to support common business processes—the two projects were merged.

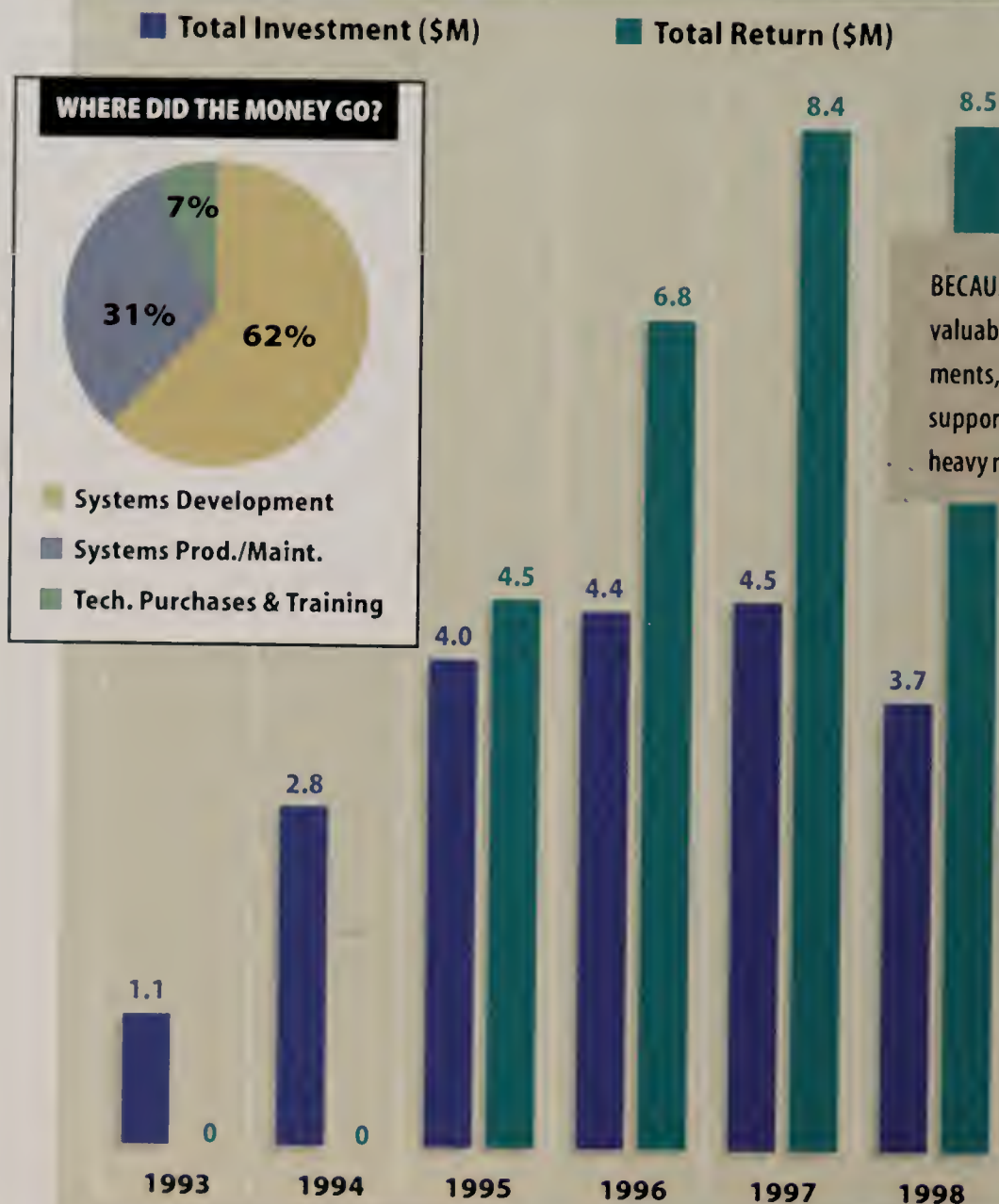
Before one line of code was written, the technologists changed their approach to system development. Rather than sit in the IT&O offices and try to anticipate what users need-

ed, McFadden and Hirson moved their offices to the MMBG site in Manhattan, where they began to work side by side with the reps. "We often didn't get a chance to talk with these people before," McFadden says. "We used to have communication by proxy; everybody was guessing what they needed. As a result, we used to overengineer our systems. What they really needed was a lot less than what we *thought* they might need."

The business people, too, were surprised. They expected the technologists to come in with preconceived notions and ignore any feedback. Instead, the reps found their suggestions were welcomed and incorporated in RMS. "Nobody came in defending the system," says Lori Pape, vice president and MMBG team leader. "We always walked away feeling like the technical folks were really listening to what we said. As a result, everyone had a sense of ownership of the system."

The RMS development team's first objective was to integrate in a PC/LAN environment what had been a series of separate legacy applications dedicated to banking functions such as

THE NUMBERS: CHASE MANHATTAN 1993-98



accounting, fee-based services, credit analysis, profitability and performance management. Combining systems such as CAPRS and FMR into a single application not only would decrease system redundancy but also would eliminate data duplication while linking diverse platforms and MMBG's multiple offices. Users would also be able to drill down through data and view as little as a single account or as much as a rep's or team's entire portfolio. That would allow reps and their supervisors to see how an individual's accounts stacked up against others within a single team or region, or in MMBG as a whole, to help track performance and trends.

The next development challenge was to give the integrated system a Windows-based GUI and set it up to run spreadsheets and reports using the common Microsoft desktop suite. To preserve data integrity, the development team decided from the outset that, in contrast to the legacy systems that let users manipulate the data, RMS would incorporate a strict data quality process wherein users could view, but not change, customer information. Any changes would be submitted via Lotus Notes to the core

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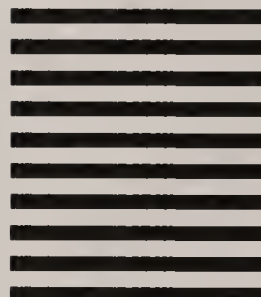
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WINNER PROFILE: CHASE MANHATTAN

ANATOMY OF THE SYSTEM

Hardware: Servers include IBM mainframes, Compaq Proliant 2000, 4500 and 5000, plus Solaris Sparc 1000 and 2000. Client PCs include 486 models with a minimum requirement of 8MB memory, one high-density 3.5 disk drive or hard drive, VGA adapter, Microsoft mouse (or compatible point device), 10MB of disk space for system files, 2MB for each client setup.

Software: RMS was developed in-house using a variety of packaged development tools including: Windows NT 3.51, Solaris 2.4 and MVS 5.22 on the server; Windows 3.1, Windows 95, Windows NT 3.51 and Solaris 2.4 and MVS 4.2 on the client; application development tools such as Visual Basic, C++, Lotus Notes, Microsoft Word, Microsoft Excel and Cobol.

Architecture: RMS routes messages through a variety of IBM mainframe applications and distributed applications via the Chase network facilities, using such protocol translations as Novell IPX/SPX, IBM SNA LU6.2 and TCP/IP.

data center in New Jersey (aside from transactional information, which is updated automatically), where they would be approved and entered by authorized managers. That process gives users confidence in RMS data. "If it is right in RMS," Hirson says, "it is right everywhere."

As with many IT projects, the interpersonal challenges surpassed the technical ones. Chase had to unite its own diverse IS subgroups, including the network and customer service teams that were accustomed to working independently, under varying reporting structures within the greater IS organization. This diplomatic dance was trickiest when the IS members of the development team found themselves actually advocating business issues to other IS groups back in the office. "Some tech teams would say, 'I don't think [the users] know what they want,'" says Ray Clarke, a management consultant with Middle Market Information and Management Systems at Chase, "and we'd have to say no, this really is what they want."

To resolve those conflicts, the RMS development team stuck to a democratic approach to problem-solving. Priorities were voted on, and team members had to bow to the majority. That approach often resulted in compromise, but it also developed cross-functional

By the end of last year, RMS had been provided to about 700 of Chase Manhattan's 1,000 middle-market reps, including those brought aboard during the merger, and the company now plans to implement parts of the application in other Chase Manhattan banking units. Also, Texas Commerce Bank, a subsidiary of Chase Manhattan, has adopted RMS for all of its commercial and private bankers—about 1,000 users all told—and it has earmarked money to help Chase research and develop future modifications. The goal in 1997 is for RMS to be fully deployed on an intranet so that the bank's mobile sales force will have remote access.

Already, RMS has given MMBG a 33 percent increase in calls on existing customers and prospects, and portfolio profitability has increased 27 percent. "It's very easy to see where we're making money, where we're not and what we have left to address," Lourenso says. And now when Lourenso asks reps how many accounts they manage, he gets accurate numbers.

The success of RMS has not gone unnoticed outside Chase Manhattan. Larry Prusak, a former Ernst & Young consultant who recently joined IBM Corp.'s Consulting Group in Boston as a managing principal in

"What the sales reps really needed was a lot less than what we thought they might need."

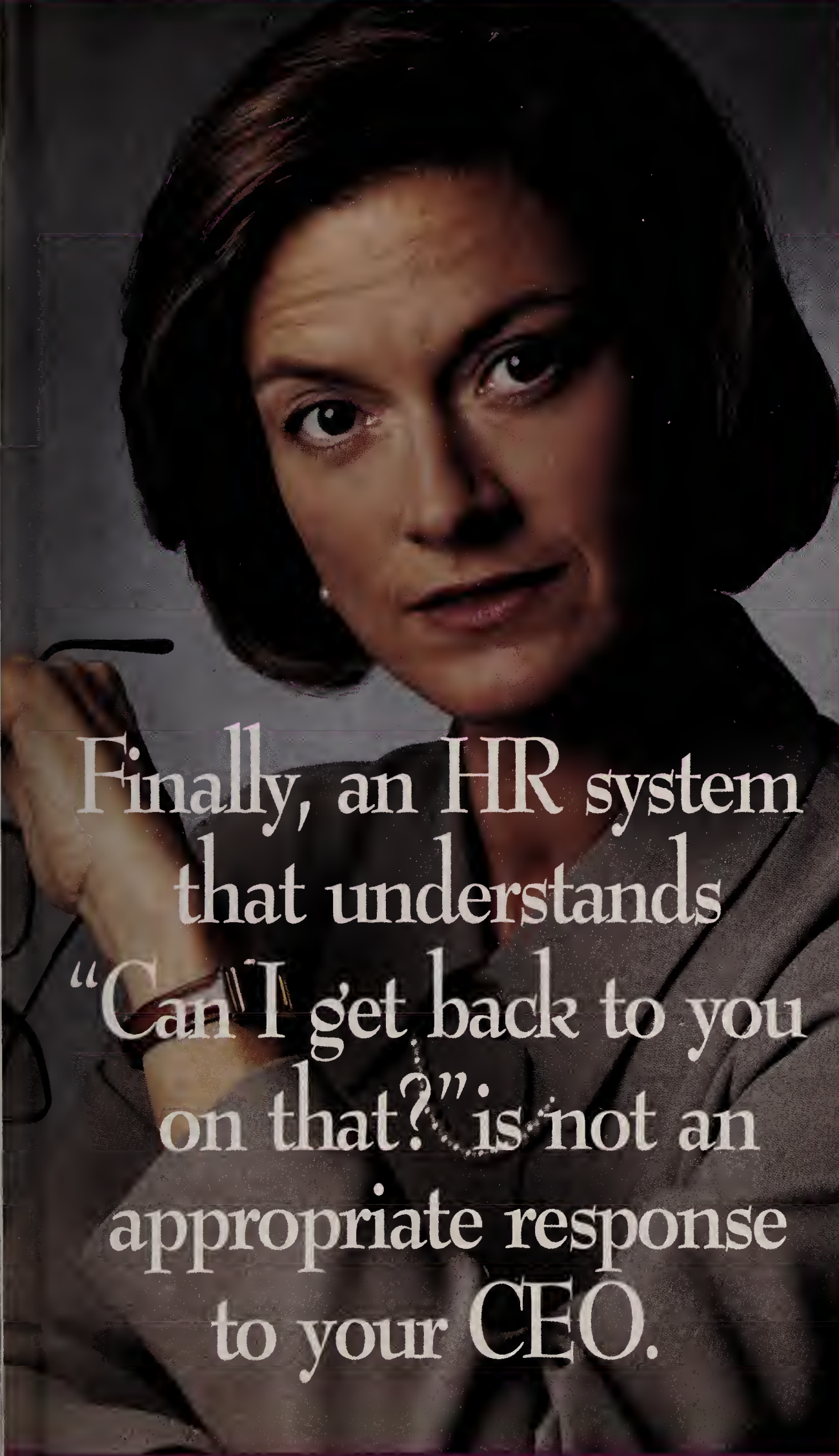
—JOHN MCFADDEN

collaboration and trust. "People are comfortable working together and willing to cross lines," Clarke says. "Nobody says, 'It's mine' or 'It's yours.' It's *everybody's*."

After five prototypes were built, tested and tweaked, the first live version of RMS was rolled out to one of MMBG's teams in the summer of '94. Joe Tune, senior vice president and MMBG regional manager, likens RMS to a prospector's dream. "There was a lot of gold in all that data in the old management information system, but it wasn't easy to extract," he says. "RMS is like a stick of dynamite that blows away all the rock so you can get to the gold." Deemed successful in Tune's office, RMS was rolled out team by team throughout MMBG. Daniel Greene, a vice president and MMBG team leader, says initially there was some resistance to RMS when it was introduced to his Long Island office. "People were willing to ignore it," he says. But that attitude changed as soon as people realized that it really did help them do their jobs better.

knowledge management, was so impressed by the system that he recently invited system developer McFadden to share the RMS story with a conference group. But it was more than the technology that got Prusak's and the audience's attention. "What's interesting in particular is the way they went about building the system," Prusak says. "[The developers] actually went out there and sat with the users. They listened, watched and absorbed their culture before they did a thing—watched how they worked, to see how technology could make them do their jobs better." That approach, Prusak says, resulted in a system and a business/IS relationship that gave RMS an impressive ROI. Concludes Denis O'Leary, executive vice president and CIO, "The challenge really is to get the business and IS groups to coalesce around a partnership that will endure and a technical infrastructure that is sturdy." 

Staff Writer Tom Field can be reached at tfield@cio.com.



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Edited by Elaine M. Cummings

Integrated Messaging

The universal in-box arrives

BY CURTIS F. FRANKLIN JR.

ERIC SCHMIDT HAS LAWYERS on the run. He also has them in the air and at client offices across the United States. As director of information services at Bricker and Eckler, a Columbus, Ohio, law firm, Schmidt sees it that his organization's information infrastructure doesn't waste a moment of the firm's most valuable resource: attorneys' billable hours.

One way Schmidt has responded to the company's need for efficiency is by introducing integrated messaging, a system that brings several different message types to the user through a single interface. "Integrated messaging is just part of the long-range scheme we set up two years ago that focuses on access to resources," Schmidt explains. "We want to make things easier and more efficient for the attorneys when they're on the road."

What Is "Messaging"?

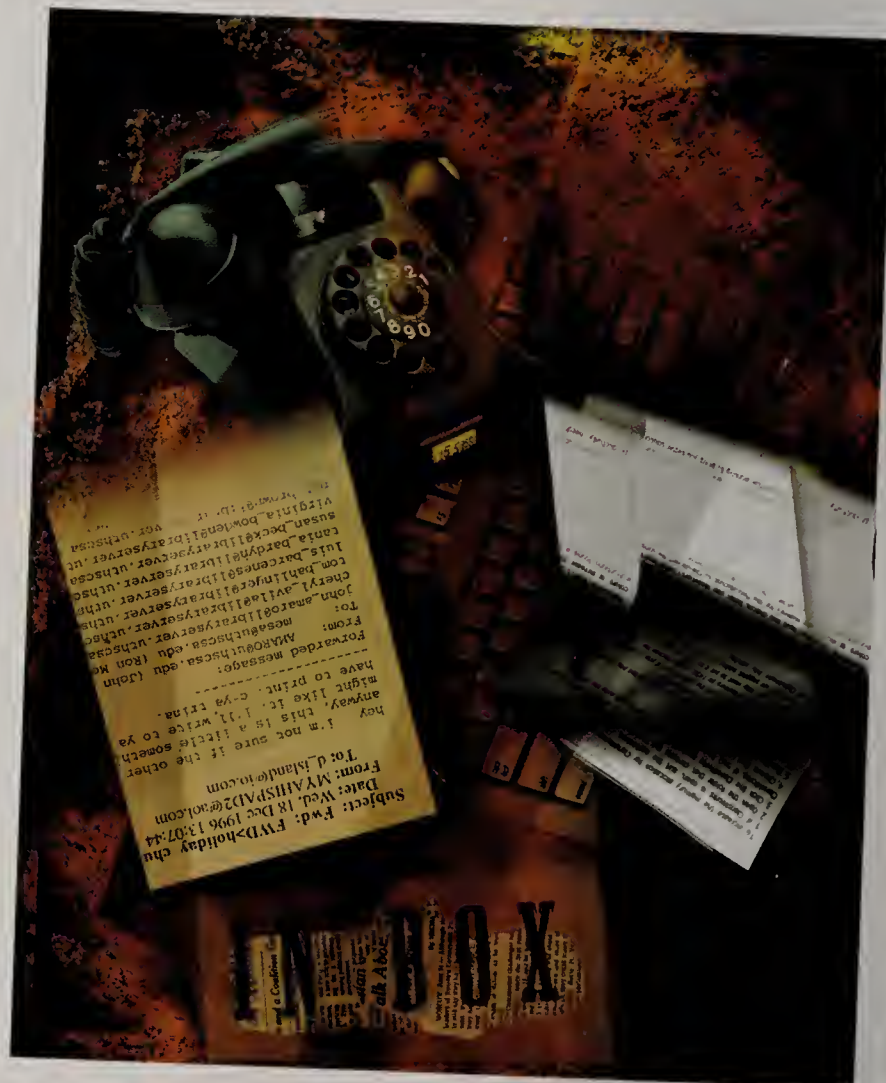
Some companies feel they've taken a major step toward integrated messaging when they build a system that joins internal e-mail with the rest of the world, using the Internet. Others don't invoke the integrated messaging mantra until computer-based fax retrieval has joined the mix. Still others, like Bricker and Eckler, go for the integrated messaging brass ring, joining e-mail, fax and voice mail in a unified communications system.

One of the basic assumptions of integrated messaging is that all messages are not created equal. Anyone who has retrieved voice mail from the road has felt the frustration of listening to a dozen frivolous messages before getting to the one crucial message. In an e-mail interface, users can see the subject of a message and the sender's name before deciding whether the message

should be deleted, read later or read immediately. The e-mail-centric interface of most integrated messaging systems allows the same scanning and triage for voice-mail messages as well. Some users feel that the power to know whom the message is from before listening and how important it might be is worth any pain that might accompany the switch to a new messaging system.

Giving users an efficient way to retrieve messages and an effective way to deal with them once retrieved are the twin pillars of today's integrated messaging plans. "Integrated messaging is the automatic delivery of information over a network," says Tim Patterson, manager of public relations for the business communications systems group of Lucent Technologies Inc., located in Basking Ridge, N.J. Using the concept of a "universal in-box," users can sit at their PCs and answer their voice mail, send or receive e-mail or faxes, and even send images from a single screen.

The system must be adaptable for occasions when message pickup can't involve a computer. Given that even the most dedicated laptop computer users admit there are times when it's easiest to pick up a telephone and simply call the office, the typical integrated messaging sys-



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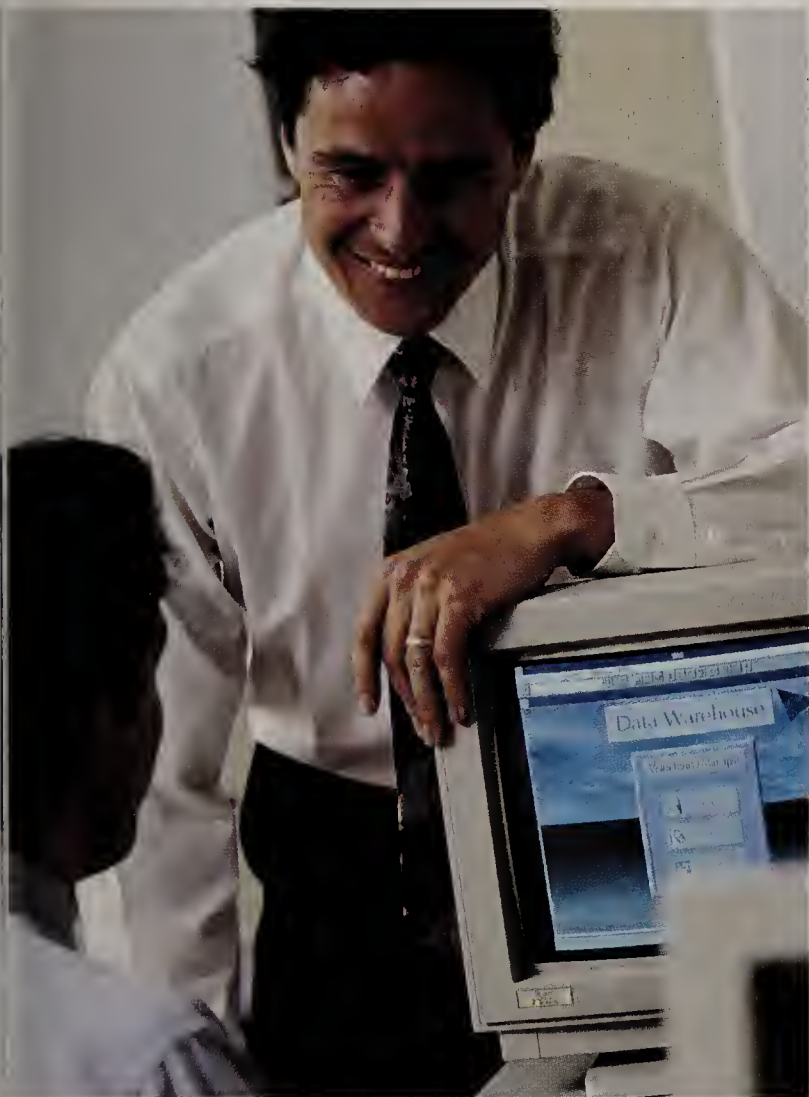
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Emerging Technology

tem must allow for control of message retrieval and disposition from a standard touch-tone telephone as well as from a multimedia computer.

Interface and access methods now boil down to the e-mail interface on most organizational systems. Both Microsoft Exchange and Lotus Notes have add-on components that notify the user of, and lets them control, voice-mail messages the same way they now manage e-mail and fax messages.

But like many simple concepts, the universal in-box quickly becomes complex in execution.

So Many Standards

The most important group of technologies for implementing integrated messaging fall under the rather broad rubric of computer-telephony integration, or CTI. Those technologies enable computers to control electronic telephone switches that, in turn, send message traffic and control confirmations back to the computers. That control passing technology has existed since business telephone switches first were computerized nearly 30 years ago; however, a variety of solutions from companies whose primary business was not telephones had to wait until standards were developed for the control messages to meet.

The two standards most often used in CTI are Telephony Application Programming Interface (TAPI) and Telephony Services Application Programming Interface (TSAPI). In the beginning, TAPI and TSAPI did not seem to be competitors at all. TAPI began as a standard primarily concerned with first-party call control (where a user sitting at a workstation decides which messages to retrieve), whereas TSAPI focused on third-party call control (where a central computer decides which user should receive which calls). Over time, each standard expanded to include functions originally supported by the other. Newer standards, such as the Java Telephony API under development by Sun, Lucent, Novell, Intel, Nortel and IBM, start with the understanding that a useful API must deal with both types of control. "We decided that the primitives needed for third-party control were the superset,

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CHEAPER, EASY-TO-USE software is making CD-Recordable (CD-R) drives a tool for ordinary managers.

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Hewlett-Packard Co. started the

RECORDABLE CDs

trend in October 1995 with the first recordable CD-ROM to sell for less than \$1,000. Now other manufacturers, such as Mitsumi Electronics Corp., Philips Electronics NC, and Smart and Friendly have followed suit, and the price of CD-ROMs on the desktop has dropped into the \$500-to-\$750 range.

In 1996, 1.3 million CD-R drives were shipped to resellers, according to Freeman Associates Inc., a Santa Barbara, Calif., market research firm specializing in storage. This year, the firm expects the number to increase despite the imminent switch to a new CD-like format called Digital Video Disc.

Inexpensive CD-R drives and the ubiquity of CD-ROM in modern office computers let companies distribute databases, financial information and presenta-

tions conveniently to offices, business partners and customers. A CD-R can hold up to 650MB of data, pictures or sound in a universal format.

The new generation of recordable CD-ROMs turns producing custom CDs from a centralized job for specialists into something any manager can do. That "democratization of process" makes the CD-R a powerful information tool for the organization. CD-R manufacturers are adding features and bundling software to make the drives easier to use. Arcane data is hidden by the new software.

Of course, there are some drawbacks. The one-at-a-time production process on these low-cost drives is a lot like copying information onto floppy disks—but even slower. Unlike more expensive CD-R systems, which can record multiple copies automatically at six times the average speed, the fastest low-cost desktop units record at only twice the average speed.

An organization that needs hundreds or thousands of copies of a CD is better off with the conventional mastering/reproduction process because of cost and labor considerations. However, the new CD-Rs give the flexibility to produce a few CDs for limited distribution more quickly than making a master and sending it out for reproduction.

—Tom Wailgum



and first-party control was the exception," says Sun Microsystems Inc.'s James Wright, manager of computer telephone integration.

Upgrading Requirements

A typical personal computer can process

e-mail with a minimal complement of hardware. Including fax capability tends to be a matter of adding fax-equipped modems to a server rather than adding hardware at the desktop.

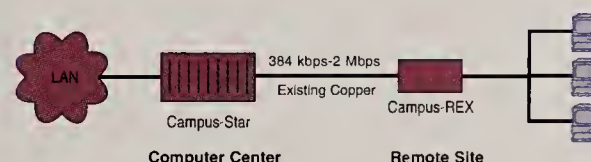
When voice mail goes on the menu, on the other hand, hardware upgrades

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to PCs are required. Multimedia PCs, with their speakers and microphones, have traditionally been seen as home consumer products, but the game-friendly sound systems are precisely what users demand when they listen and respond to voice mail through the PC. The availability of inexpensive, high-quality sound cards, speakers and microphones are critical to making the integrated messaging workstation possible, but they can add considerable complexity to systems maintained by already overburdened staffs.

Upgrading a personal computer to handle integrated messaging is useful only as long as the user can access that computer. For organizations such as Bricker and Eckler, providing access to e-mail through a telephone is as important as providing access to voice mail through a computer. Turning telephones into messaging workstations doesn't necessitate more intelligent telephones—it requires text-to-speech conversion at the messaging server.

Text-to-speech use is growing, although there are still concerns regarding two aspects: one is technical, the other social. Technically, converting text into sound puts a considerable load on the CPU of the message server. Because text can be stored much more compactly than sound, it is unwieldy to preprocess messages into sound files just in case someone wants to listen to them. Instead, conversion happens “just in time” when the workstation involved is a pay phone rather than a computer.

Have Message, Will Travel

Ask IS executives why they're considering integrated messaging and “our mobile professionals” will likely be a part of the answer. “Remote access is very important,” says Julian Smith, director of information systems at Thompson and Co., an advertising agency headquartered in Memphis, Tenn. “Most of our people will work at home or be out of the office at various times, so getting messages in a timely, cost-effective manner is crucial.”

IS directors say the pressure to integrate messaging systems comes from users more often than from corporate managers. “The impetus driving integrated messaging is coming straight from the users most affected by the technology,” says Schmidt. “Over the last three years, as we've built our systems, the attorneys have been pushing the technology,” he says. Professionals accustomed to accessing all types of messages at their desks are unwilling to forgo e-mail while away from the office.

While requirements for mobile professionals may drive the move to integrated messaging, the need to optimize people's skills even when they're at their desks plays an important reinforcing role. Sun's

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Companies usually try to solve that problem by adding faster network links, which is expensive and often ineffective during times of heavy and unexpected traffic. Internet users with high-speed access (T1 line or faster) exacerbate the problem by impinging on or even monopolizing bandwidth.

Packeteer Inc.'s **PacketShaper** offers companies another way to solve the bandwidth problem. PacketShaper is a hardware/software solution that enables network managers or webmasters to set up and enforce policies on which individuals or groups of users

should receive access and bandwidth priority. That hierarchical ranking applies to both inbound traffic (outside users accessing corporate Web sites) and outbound (Web browsing by corporate intranet-connected users). For example, a manager can tell PacketShaper that an external business partner's visit is more important than an internal employee's. If both the customer and employee log on at the same time, PacketShaper will divert bandwidth from the network to the partner to ensure that his experience is as fast as his system allows. The employee, on the other hand, will be given less bandwidth and speed, regardless of the system he is using. Bandwidth allocation policies can be based on connection speed, application type or IP address.

PacketShaper sits on the network access link between the access router and the Web server. In future implementations, the software will be incorporated directly into network devices. It is manageable via a standard HTML browser and is supported on major browser platforms, including Netscape Navigator and Microsoft Internet Explorer. A two-level password security system prevents unauthorized access. As of press time, prices were not yet available. For more information, visit www.packeteer.com or call 408 364-0197.

Converging Technologies

IF YOU HAVE EVER DREAMED ABOUT integrating voice, data and video on one network, thereby saving your company big bucks and saving yourself big network management headaches, then you probably know that technological advances are rapidly bringing your dream to reality. ATM, a.k.a. asynchronous transfer mode, is getting more affordable and more workable every day. But how exactly is your company going to move from data networks on the LAN and corporate phone networks on the PBX to the new world of ATM-based switched networks?

San Jose, Calif.-based Madge Networks Inc. has an answer. Called



ILLUSTRATION BY MARK FISHER

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Emerging Technology

Wright says the early adopters of the universal inbox are at companies predisposed to lean on technology for productivity gains. "The early adopters of messaging are in the upper tier of the Fortune 500 that are already invested in an integrated LAN environment," he says. "These are typically heavy e-mail and heavy voice-mail cultures, so they have history." Integrating all messages on the computer desktop allows the user to prioritize messages visually, dealing with each in the order of its importance rather than its arrival.

Costs and Benefits

The benefits of integrated messaging are compelling to a growing number of companies, but the most enthusiastic early adopters must consider a number of issues before making a decision.

The cost of upgrading all the personal computers in the organization to handle the requirements of voice-message retrieval must be carefully weighed against the anticipated benefits. In addition to the purchase price of new hardware and software, companies must be ready to pay for supporting this more complex environment and verifying the compatibility of necessary new software.

The cost of the new corporate telephone switch or PBX also must be factored into the formula. For many companies, that issue alone will limit the use of integrated messaging, since a nondepreciated switch represents an investment that no CFO will write off lightly.

Directors and CIOs who worry about the integrity and safety of corporate information may be concerned about the security and reliability of integrated messaging. Some systems require that all message types be stored on a single server, rendering much of the organization's message data vulnerable.

Finally, the impact of integrated messaging on the culture of the enterprise can't be ignored. Among users, increased efficiency in messaging may also lead to a greater reliance on it, which could change the dynamics of personal relationships. Among the technical staff, integrated messaging will require telephony and IS staffs to work together or even be integrated into a single organization. Despite the caveats to users and still-developing state of the technology, users will press IS professionals to provide more integrated message functions. Schmidt's attitude may be the most useful in dealing with the situation. "I think it's exciting," he says. "I've been looking forward to it for a while, and I think it's about time." **CIO**

Curtis F. Franklin Jr. is a freelance writer and director of Client/Server Labs in Atlanta. He can be reached at cfranklin@cslinc.com.

LEADING

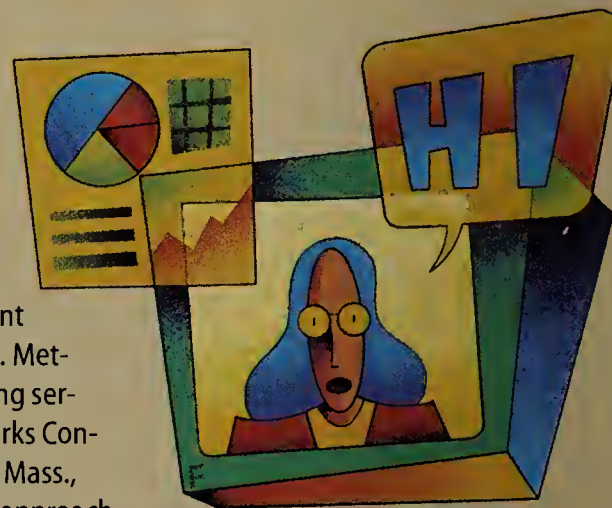
EDGE

MadgeOne, it's a switched network architecture designed to integrate data and real-time applications over a single network with an ATM backbone. By integrating data, desktop videoconferencing and voice telephony on a single network, companies can

preserve their investments in existing LAN technologies while preparing for the brave new integrated world of the future. In fact, according to a recent

white paper by James A. Metzler, director of consulting services at Strategic Networks Consulting Inc. in Rockland, Mass.,

MadgeOne's integrated approach can reduce the capital and operational costs of delivering voice services to each desktop by about 55 percent annually, compared with the cost of delivering telephony services over traditional PBXs. ATM Access Switching, ATM Desktop Solutions and ATM Backbone Switching products are already available. Madge will roll out additional products and services such as network management extensions, routing services and legacy LAN desktop support in 1997 and 1998. And partners such as France Telecom, Intel Corp., Mitel Corp., Novell Inc. and PictureTel Corp. have signed on to support the architecture. For a copy of the Strategic Networks Consulting study or for more information about MadgeOne, visit www.madge.com or call 800 876-2343.



Getting Connected

COMPUTER USERS HAVE COME TO ACCEPT that most applications don't mix. In fact, a user today who asks why you can't send data from a legacy database to a CAD/CAM application to a word processing document might even be considered naive.

So it won't be easy for the people at newcomer **AnySoft Inc.** to convince users that it's possible to route any kind of digital content from any source to any destination. That's right—text, graphics, video files and tables can be gathered or stored regardless of their origin and can then be sent to files, open or closed applications, servers or e-mail. Windows in one application can be linked permanently to windows in another. Open one window and you instantly get a view of the other or receive imported data from it. AnySoft allows live links, so real-time data updates made in one application will show up in the linked application automatically. The most immediate payoff for users is the ability to link legacy data easily to modern desktop applications.

This operating system technology is based on application programming interfaces that utilize dynamic link libraries. Available now for Microsoft Corp.'s Windows 3.x, 95 and NT, the software eventually will support Macintosh OS, OS/2 and X Windows. For more information, call AnySoft in Cambridge, Mass., at 617 868-3397 or visit www.anysoft.com.

ILLUSTRATION BY MARK FISHER

Distributed Objects for the Enterprise

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SSA's DOCA is CORBA conformant, ensuring that SSA's software operates in compliance with the Object Management

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Interoperability with other CORBA conformant object applications is assured. The flexibility and configurability of a message based architecture is inherent in BPCS Client/Server.

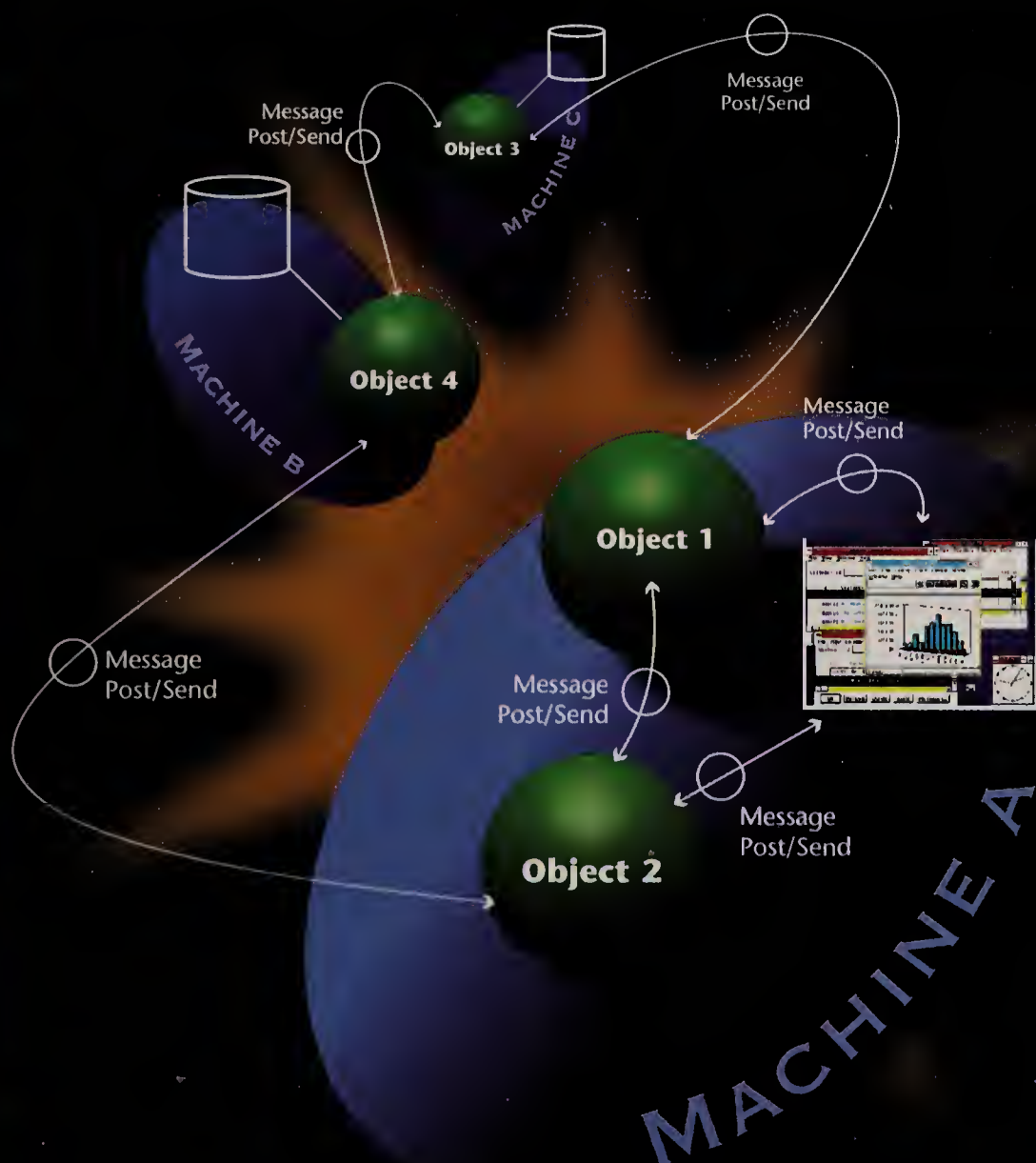
SSA's distributed object tool set— Object Development Workbench (ODW)— builds robust, state-of-the-art Client/Server applications. BPCS Client/Server includes drag and drop, embedded objects, and other third generation client/server user interface functions.

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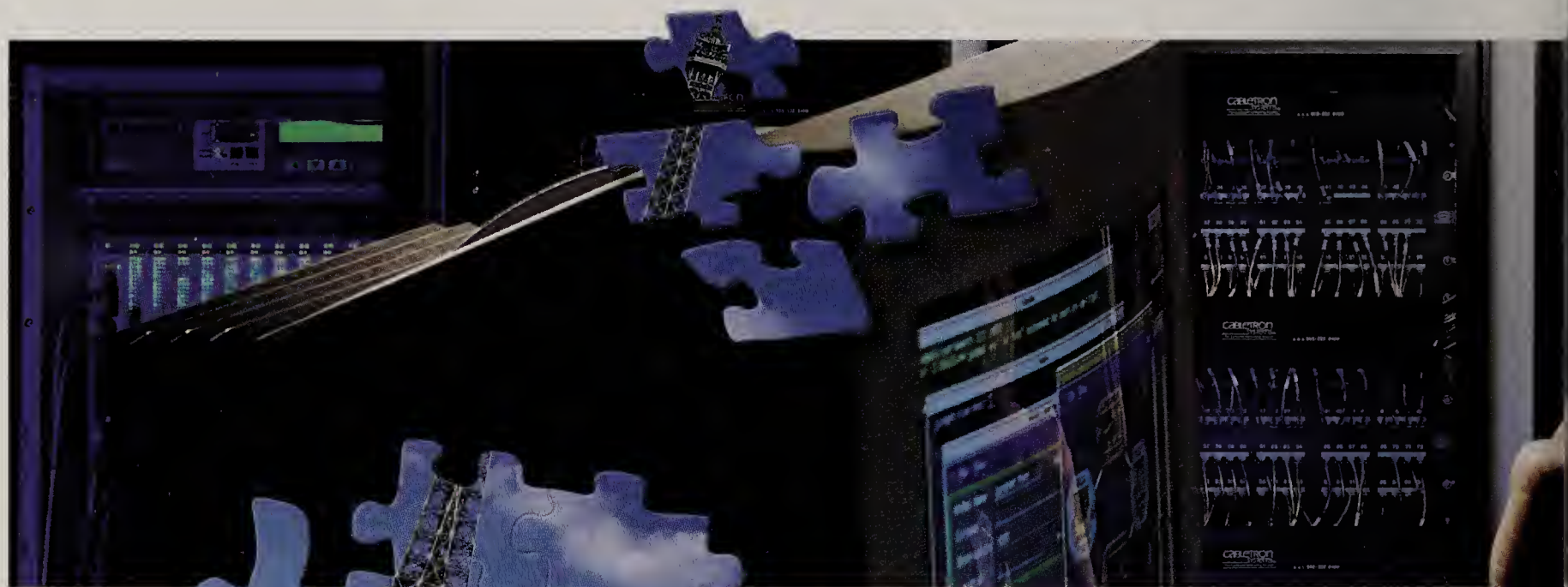
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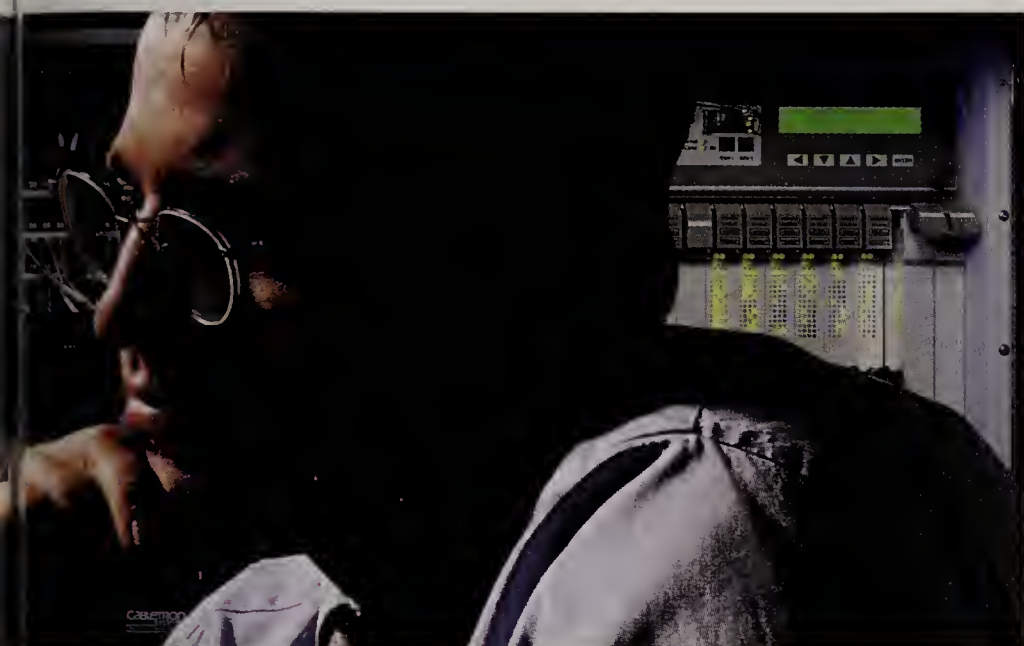
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Working Smart

MAXIMIZING THE PAYOFF FROM INFORMATION TECHNOLOGY

MUCH OF THE impetus to reinvent government comes from the desire to eliminate the waste and fraud that have become an ingrained—and expensive—aspect of many publicly funded programs. When Texas Comptroller John Sharp set out to reform the state's welfare program in 1991, he proposed implementing an electronic benefits transfer (EBT) system for recipients of Aid to Families with Dependent Children (AFDC). The system would replace food stamps and AFDC checks with debit cards as well as dispense small amounts of cash to AFDC recipients. Known as the Lone Star System, Sharp's brainchild has been operating statewide since November 1995. As a result of going electronic, the state of Texas and the federal government have saved millions of dollars and taken a big bite out of fraud.

Sharp proposed to the Texas legislature the ambitious plan of revamping the food stamp system administered by the Texas Department of Human Services in Austin. As in many other states, food stamps in Texas often were used fraudulently. Two of the most common methods of abusing the system included stealing food stamp coupons from the mail and spending the change received from grocery purchases on unauthorized items such as cigarettes and beer. Sharp believed an electronic system would reduce the fraud and waste inherent in the paper-based system as well as eliminate much of the associated paperwork and bookkeeping requirements.

In 1992, Sharp submitted plans for the EBT system to the federal government. By 1994, Texas received approval for the project and awarded a contract to Transactive Corp., a third-party service provider in Austin. Transactive's mission was to design, implement, install and

Texas's Electronic Benefits Transfer System

Vital Statistics:

- **Organization:** Texas Department of Human Services
- **Application:** Electronic benefits transfer system
- **Technologies:** Transactive/GTech proprietary software; Digital Equipment Corp. Alpha control systems and VMS operating system; Sybase Inc. relational database platform; VeriFone POS terminals, PIN pads and printers; 9510 ANSI standard EBT third-party interface
- **Scope:** Delivery of benefits statewide to 1.2 million households through 16,000 retailers
- **Sponsor:** John Sharp, comptroller for the state of Texas
- **Objective:** Cut costs and bureaucratic overhead by providing an alternative to food stamps and reduce fraud associated with paper stamps
- **Payoff:** State and federal savings will reach \$126.6 million through the year 2001, with direct savings for Texas taxpayers totaling \$10.6 million over that time.

administer the project, with help from the Texas Department of Human Services. In September 1994, a pilot project began with 600 retailers and 16,000 recipients. The system was then phased in statewide on a region-by-region basis.

Instead of being issued food stamp coupons or checks, eligible AFDC and food stamp recipients now get a plastic debit card called the Lone Star card and a four-digit personal identification number. Cardholders can draw food stamp benefits at supermarkets, pharmacies and other retail outlets as well as small amounts of AFDC cash benefits from automated teller machines. At checkout counters, cardholders swipe their Lone Star cards into point-of-sale scanners (provided free to retailers) that record their purchases. Each cardholder's

account balance is maintained in the state's computer system and is automatically debited when purchases or withdrawals are made. The Lone Star System ensures that no cash ever changes hands during a grocery purchase.

For recipients, presenting a plastic card at the checkout counter goes a long way toward removing the stigma associ-

ated with receiving welfare benefits. Since the system was implemented statewide, 16,000 retailers have processed 150 million transactions through Lone Star. The Lone Star card will save the federal government \$79 million over seven years by doing away with the costs of mailing and processing the old paper coupons to Texas's 2.4 million food stamp recipients. And the system has clear benefits when it comes to reducing fraud. For example, Houston police used the electronic records created by the system to shut down a \$1 million food stamp fraud ring. The electronic benefits transfer system also had increased grocery sales at selected individual retailers by an average of 10 percent, which

Sharp says is anecdotal evidence that cardholders were spending less money on unauthorized goods. In addition to increased food sales, benefits reported by participating grocery retailers include reduced administrative costs and improved service to their customers thanks to quicker checkout lines.

"Clearly, the Lone Star card has benefited retailers and the families who depend on food stamp benefits to feed their children," says Sharp. "However, the folks who have benefited the most from the elimination of paper food coupons are taxpayers."

Paula Jacobs is a consultant and writer based in Framingham, Mass. She can be reached at pjacobs@world.std.com.

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- ③ **Project2000.** Monitors and controls all conversion activities; confirms formats; reports progress.
- ④ **Convert2000.** Converts source code, JCL, PROCS, and SORT and IDCAMS control cards.
- ⑤ **File2000.** Converts and compares data files; performs physical and dynamic file bridging; quickly and easily validates changes.



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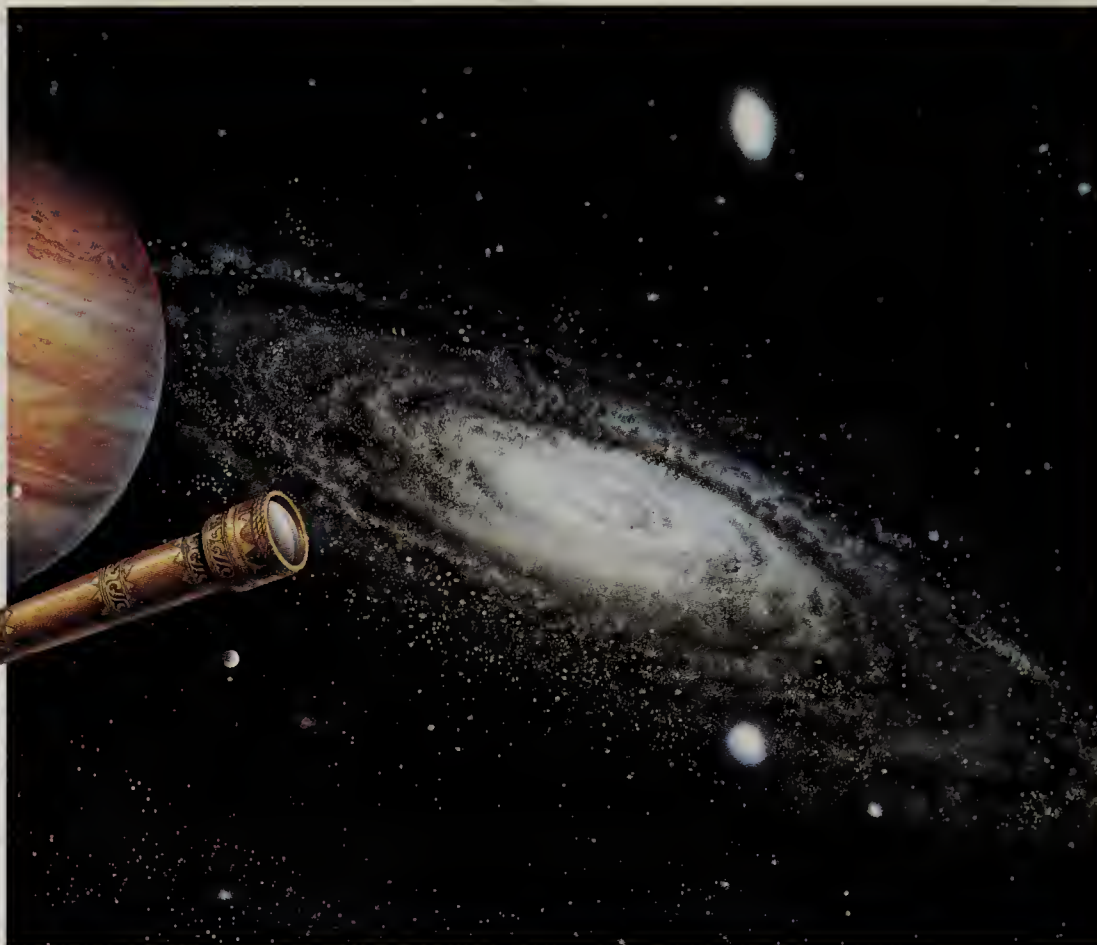
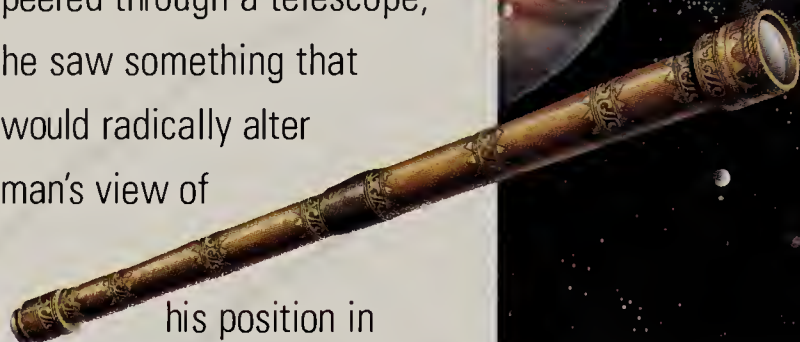
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Galileo combined data with new technology, drew conclusions from careful observation and informed others of his astounding findings.

When Galileo first peered through a telescope, he saw something that would radically alter man's view of

his position in the cosmos — evidence that the earth was not the



HOW CAN LOOKING THROUGH A TELESCOPE MAKE THINGS SMALLER THAN THEY APPEAR?

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center of the universe. The data showed the earth to revolve around the sun.

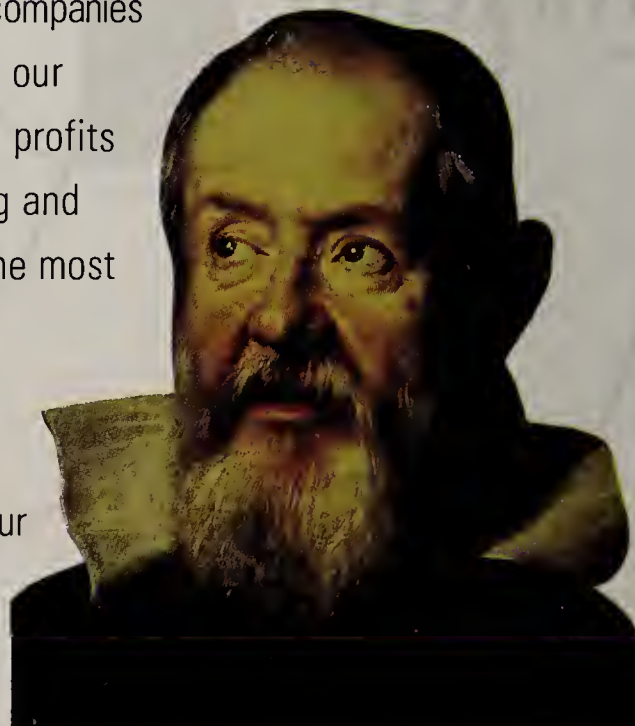
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CONTINUED FROM P.

So although only 14% of current CIOs have been on the job as CIOs for more than five years, 40% of IT vice presidents and 35% of IT managers and directors – individuals who frequently serve as the chief IT decision-makers – have been in their positions for more than five years.

High-technology companies that market to the education, medical and legal-services industries need to be most relationship minded: In those industries, CIOs departed after an average tenure of 7.8 years. CIOs in the wholesale and retail trade, utilities and manufacturing industries registered an average longevity of about seven years. Finance, real estate and insurance IT executives had job tenures of 5.5 years.

Buying Clout

Along with the CIOs' longevity has come increased buying clout. Businesses are funneling more money than ever into the IT budget. *CIO* Magazine's 1996 Reader file Study shows the average 1997 IT budget pegged at \$26.9 million, up from \$21.2 million in 1994 (See chart below. For more information, please contact Bridget Camarata at 508/935-4035.). These fatter budgets are firing greater global connectivity and increased IT staffing.

The Position and Clout of the CIO Continues to Grow

	1997	1994
IT Budget	\$26.9 Million	\$21.2 Million
Company Revenues	\$3.3 Billion	\$2.7 Billion
Number of Employees	18,600	16,500
Number of IT Employees	908	23
Number of IT Locations	28	23

Averages from *CIO* Reader Profile Studies, MRI, 1994 and 1996 *

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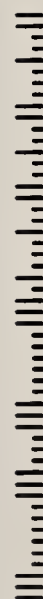
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2) Which articles are most useful?

3) Which articles are least useful?

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What's NEW@

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The 1997 Spring *WebMaster Perspectives* conference will be held at the Doral Golf and Spa Resort in Miami, Florida, May 18 to 21 and will feature Geoffrey Moore, noted author of *Crossing the Chasm*, as conference moderator. The conference's theme is 'A Tale of Two Webs: Making Your Intranet and the Internet Pay Off.' Among the featured speakers is Lori Fina, executive director of The Electronic Frontier Foundation. This forum is an excellent way to reach top-level IT and business executives with your marketing message.

For more information on available sponsorships, please contact your local sales representative or Lynda Rosenthal at 508/935-4273. ☒

WebMaster Debuts Two Online Feature Forums

WebMaster is featuring two online discussion forums, including 'Electronic Commerce,' which began in January, and 'Web ROI,' which will begin on April 14. For more information on online marketing opportunities for the 'Online Feature Forum' introduction page, please contact Lisa Brown at 508/935-4470 or lbrown@cio.com. ☒

New WebMaster Budget Survey Available

With average IT budgets of \$14 million, average Web budgets of \$2 million, and enterprise purchase authority, *WebMaster* readers are a prime target for your advertising message.

For more *WebMaster* demographic and budget information, please contact your regional sales representative or Bridget Cammarata at 508/935-4035. ☒

CIO Editorial Calendar

Apr 1	Feb 21	An Outsourcing Buyers' Guide
Apr 15	Mar 7	CIOs & Webmasters: Godzilla Meets Mothra
May 1	Mar 25	Making the Numbers: Budgeting for IT
May 15	April 8	Models of IT Governance
June 1	April 23	Blue-Ribbon Data Mining
June 15	May 7	E-Commerce Update

WebMaster Editorial Calendar

Apr	Mar 12	Web ROI
May	Apr 11	Integrating Your Internet and Intranet
June	May 12	Field Report: Data Mining
July	June 11	Special Issue: The Web Infrastructure
Aug	July 15	Special Issue: <i>WebMaster</i> 50/50 Awards
Sept	Aug 11	Schooling on the Internet



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The CIO WRAPSHEET

The *CIO WRAPSHEET* is published by the Marketing Department of CIO Communications, Inc. Please send all comments and suggestions to Cathy O'Leary Hayes, vice president of marketing or call her at 508-935-4521 or email: chayes@cio.com. © 1997 by CIO Communications, Inc.